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Minerals of Western Kentucky.

We learn by the *Railroad Record*, published at Cincinnati, that David Dale Owen, State Geologist, has lately traversed the western region of Kentucky, and has found it to be rich in valuable minerals. He states that throughout the south-western coal-field of that State, from the sources of the Tradewater, in Hopkins county, to Green river, in Muhlenburg county, the whole region is full of geological interest. There is hardly a section of a stream or ravine but what discloses materials that must at some period be a source of wealth to the owners of the soil.

In the section laid bare, from the lowest ground in Richland creek to the summit of Wright's Ridge, in Hopkins county, which may be comprised in a vertical cut 300 to 350 feet high, with its base about 200 feet above high-water, in the Ohio, there are six workable beds of coal. The average thickness of these beds is nearly five feet, and their united thickness about thirty feet. Three of these beds lie within a vertical space of thirty feet towards the base of the section, as shown on the Hunting branch of Clear creek near the dividing ridge between the Tradewater and Pond river.

The quality of some of these coals, he found upon analysis, to be equal to that of Liverpool coal, and overlying one bed he found the black band iron ore, so famous in Scotland for the manufacture of fine flowing metal for smooth castings. He found it in the southern part of Muhlenburg county, in some places of a thickness of nineteen inches to two feet, occurring sometimes in compact tabular ponderous layers, almost as black as coal; sometimes of a shaly structure or in immense segregated masses, composed of alternate layers of black and reddish-gray.

Peat Fuel—Its Treatment.

MESSRS. EDITORS—The article known under the name of "Peat," has been from time immemorial used in many parts of Europe as the only fuel of the poor, but it has great drawbacks, these, however, can be obviated if submitted to the following treatment:

Place the peat in a tank provided at the bottom with a faucet, and add a sufficient quantity of water to cover it; 1000th part of muriatic acid must then be added to the water. After it (the peat) has been soaked for about six hours, the mass ought to be well stirred, and at the expiration of twenty-four hours the water withdrawn. It would be as well also to stir the mass previous to drawing off the water; the peat will then be ready to be molded into cakes, and when dry will burn as well as wood or coal.

The acting principle in the above process, is the depriving the peat of the salts of lime and iron, which it contains in large quantities, and which prevent its free combustion.

H. C. LINDO.

New York, Nov. 7th, 1854.

[The above is very useful information to a great number of our readers.

TAPLEY'S BOILER FORCE PUMP.

Fig. 1

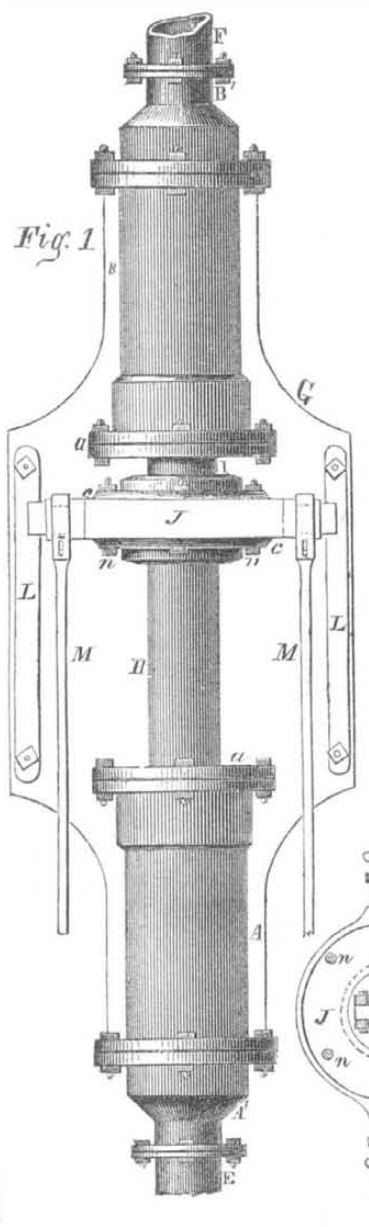


Fig. 2

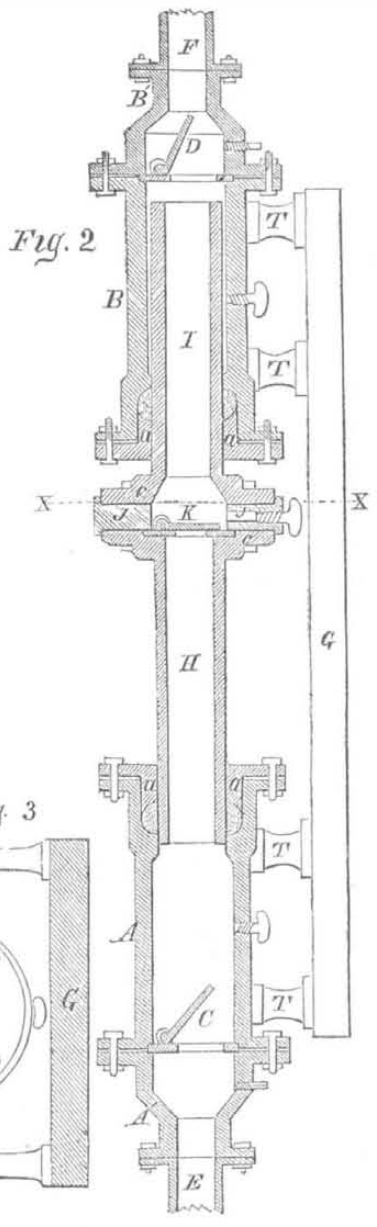
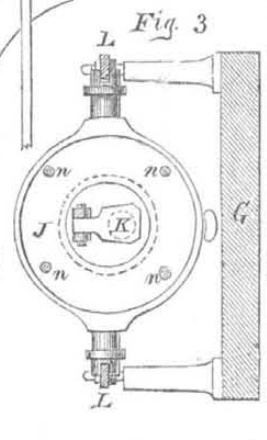


Fig. 3



The annexed engravings are views of an improvement in force pumps, for which a patent was granted to John Tapley, of Frankfort, Waldo Co., Me., on the 19th of Sept. last.—The object of the pump is to supply steam boilers with water.

Fig. 1 is a front elevation of it. Fig. 2 is a vertical center section, showing the double plunger at the extreme of its up stroke, and fig. 3 is a horizontal section, taken at line X X, fig. 2. Similar letters refer to like parts.

A and B represent respectively a suction and lifting cylinder, the axis of the one being coincident with that of the other, the two separated a suitable distance, and each made in two parts, at the juncture whereof is confined in the one an induction valve, C, and in the other an eduction valve, D. The outer ends of the smaller of the two parts, A′ and B′, of both cylinders are contracted or reduced in diameter to connect with the suction and discharge pipes, E and F, and the two parts of each cylinder are furnished with flanches by which they are bolted together, so as to secure and allow the valves, C and D, to operate freely. The cylinders thus constructed and arranged are mounted on a frame, G, by flanched legs, T, cast with and projecting from the cylinders, or they may be secured by clasp bands, bolted to the frame, and embracing the said cylinders, or in any other convenient manner.

A double plunger is arranged between the cylinders, and working in both. It is composed of two tubes, H and I, united to a cross-head, J. These plungers work through stuffing boxes, *a a*, of the usual construction, fitted to the ends of the cylinders to guide the plungers and prevent leakage. The diameter of each plunger is a little less than the bore of the cylinders, so that the friction of the plunger is confined to the packing of the stuffing box, which, when worn out, can be replaced with but little trouble and expense. These plungers are of equal length and diameter, and are secured to the opposite side of an annular cross-head, J, having an opening coincident with the bore of the plungers, but slightly larger, to receive a valve, K, and the bore of the plunger at its end is also slighily enlarged (as seen in fig. 2,) to allow the free action of the valve. The adjacent ends of the plungers are represented as enlarged, or furnished with annular flanch-heads, *c c*, and and fitted into recesses formed in the adjacent sides of the cross-head, J, and confined by screw bolts, *n n*, but it is very obvious that the three parts may be formed and united together in any convenient manner, provided they are so formed and connected that they will receive a valve between them, and can be easily separated to repair or replace the valve. The length of each plunger is about equal to that of the cylinder within which it works, and the distance of the traverse of each plunger between the cylinders is a little more than one-third of its length, so that it will be seen, when the double plunger is at the extreme of its up stroke, the end of the lower plunger will be near the top of the suction cylinder, and the cross-head near the bottom of the lifting cylinder, and in this position of the parts, the air floating on the water always passes from the cylinder, A, into the lifting cylinder, B, leaving the water to occupy the entire space of the cylinder, so that on the descent of the plunger, whatever air may be above the water will be expelled in advance of the water. The cross-head of the double plunger is fitted to ways, L L, on which it traverses with the movement of the plungers, and by which the latter are steadied and prevented from turning. The double plunger is operated by attaching connecting rods, M M, to the arms of the cross-head, and uniting said rods to a crank operated by an engine or other prime mover. The action of this pump is very simple, for it will be seen that the double plunger operates in the suction and lifting cylinders at the same time, at its up stroke, drawing water into one, A, and expelling it from the other, B, and at its down stroke, displacing the water from the suction cylinder, A, and causing it to ascend into the forcing cylinder, B, the first of these movements of the double plunger acting as a suction and forcing pump, with the induction and eduction valves open, and the latter as a forcing pump with the plunger valve open only. A minute description of the clack-valves is not given, deeming it unnecessary, as they are so well known that any intelligent mechanician will readily understand how to construct and apply them, and to substitute for them valves of other kinds, whenever it is expedient to do so. The claim is for the arrangement of two cylinders in a line with each other, connected by a frame, and fitted with valves, stuffing boxes, and a tubular plunger, which works in both, and has a valve arranged in its middle, as described, the plunger and each of the cylinders being made in two pieces, at the junction of which a valve is secured, so that without separating the cylinders and plunger, or dismounting either of them, any one of the valves or the packing of the plungers can with facility be adjusted, removed, or replaced.

One of these pumps has been in operation for the past three seasons in the steam saw mill of T. Cushing, Frankfort, Me., and has given great satisfaction. It has a tubular plunger of 3⅝ inches dia., and supplies seven boilers forty feet long (each) and two and a half in diameter; and another boiler 36 feet long, 3½ feet dia. These boilers are in one continuous line, and the pump placed at one extreme end. There are two engines in this mill, and it has been operated by Mr. Cushing for 14 years. During that period he has tried many feed pumps but none, he says in a letter now before us, equal to this. Benjn. B. Cushing, engineer, writing from the same place, states that he has witnessed the operation of Mr. Tapley's pump for two years, and that it excels all other pumps within his knowledge for pumping boiling water. He also thinks that it is well adapted for locomotives. For simplicity and durability this boiler pump appears to have much to recommend it to the attention of engineers.

More information may be obtained by letter addressed to Mr. Tapley.

Coal in Canada.

The Toronto *Colonist* states that coal has been discovered near West Bradford, C. W.—It was found on sinking for a well, and is asserted to be of excellent quality—bituminous. If this is true it contradicts geological reports of that country, but will be of immense advantage to the people.

Tennessee Industrial Fairs.

The Fair of the East District of Tennessee was held at Knoxville on the last week of October, and was a very excellent one. The Fair of the Middle Division of Tennessee was held at Nashville this year, and was also eminently successful.

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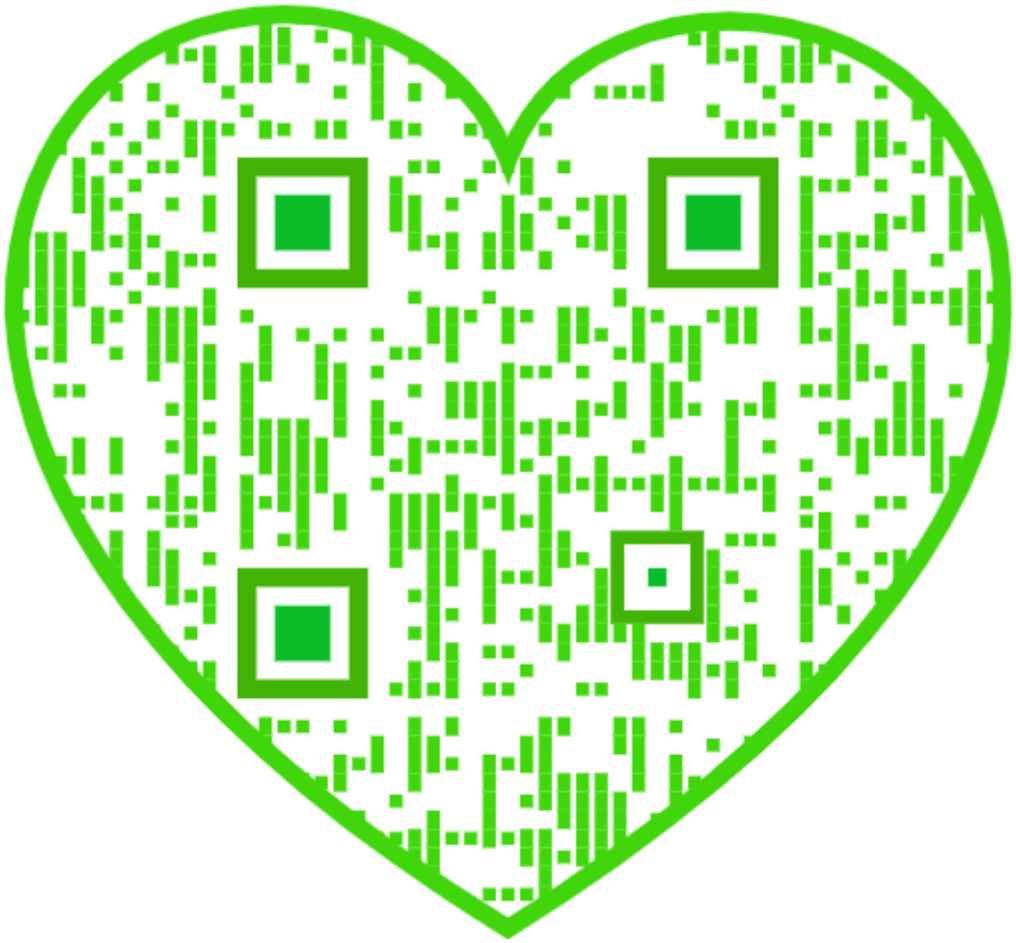

Smithsonian Institute Report.

The Report of the Secretary, Prof. Joseph Henry, for the past year, which we received last week, contains an abstract of the works published during that period, by the Institute. —One on the "Ancient Fauna of Nebraska," by J. Leidy, Professor of Anatomy in the University of Pennsylvania, is full of interest. In the Upper Missouri there exists a tract of country named the *Mauvaises Terres* or "Bad Lands," which. at one time was probably the bottom of an immense lake in which thousands of peculiar animals perished. It would appear as if the waters of this lake were removed by some great convulsion of nature, and the sediment indurated, after which the whole country was swept by an immense wave of water, which carried away the soft parts of the strata, and left the harder parts standing in a series of irregular prismatic columnar masses, frequently capped with irregular pyramids, extending from one to two hundred feet in hight. Viewed in the distance the rocky piles resemble a massive city in ruins. The valley is about 90 miles long and 30 wide, and some parts of it lie about 300 feet below the level of the surrounding country. So thickly are the natural towers studded over the surface of this region, that the traveler threads his way through deep confined passages, which resemble some of the narrow streets of the old towns on Continental Europe. At the foot of these columns the remains of the ancient animals which existed thousands of years ago (long, it is said, before man's advent upon this earth,) are found in such abundance as to form of this tract an extensive cemetery of extinct animals. This region was brought to notice by a few fossil remains procured through the agents of the American Fur Company, and the Smithsonian Institute furnished $200 to T. Culberton for exploring it. All the remains of these ancient animals which have been found are completely petrified. Some are verp perfect specimens, others are much broken, having the appearance of being at one time subject to violent action. They all belong to the classes "mammalia," and "turtles." With a single exception, all the mammalia belong to the great order of hoofed animals, and a great number of species have been brought to light. There are two species of rhinoceros, the first of the kind discovered in America, and differing from any remains of this animal found in other parts of the globe. One genus called the *oreodon.* constitutes one of the links necessary to fill up the wide gap between existing ruminants, and an exceedingly aberrant form of the same family, now extinct. One fossil of a wildcat has been discovered, and the valley abounds with fossil turtles. It is altogether a wild and peculiar antediluvian sepulchre. The Institute published a paper last year on the "Winds of the Northern Hemisphere," by Prof. Coffin of Pennsylvania; another by J. Chappelsmith, on a tornado that passed near New Harmony, Ind., in 1852; and a third on the "Antiquities of Wisconsin," in which are represented elevated mounds of fanciful forms and of great extent; they resemble lizards, foxes, birds, turtles, &c. Two papers on Botany have been furnished by Dr. J. Torrey, of New York, describing two new plants; and one by W. Stimpson on the "Marine Fauna of the Bay of Fundy." A memoir is in the press on "Microscopic Organisms," by Prof. Bailey, of West Point. At Andover, Mass., there is a bed of fossil infusiori fifteen feet thick, and one underlying the city of Richmond, Va., twenty-eight feet thick. The Croton water of New York abounds in beautiful microscopic organisms—more than fifty specimens have been discovered, and those who drink our unfiltered water swallow thousands of them daily. A second edition of the Report of the Institute on recent improvements in the chemical arts will soon be issued, and a new volume is to be prepared in due time.

The Smithsonian Institute is devoting much attention to Magnetism, and especially the dip of the needle. A number of instruments are kept in continual operation and their results recorded on prepared paper. The Library now contains 25,000 volumes pamphlets and engravings. The Museum has been increasing by steam power. It is only three years old, and yet it holds the front rank among American Cabinets.

The majority of the works which have heretofore been issued by the Smithsonian Institute, contain more curious than useful information, but we hope that its future publications will make amends for past oversights.

On Compound Interest.

The following is an article from A. Mahler, suggested by the notice to a correspondent which appeared in our columns a few weeks ago, respecting compound subtraction. —Ed.

All those who know the difficulty of extracting the roots of high powers will agree, that it is not only very difficult and tedious, but sometimes impossible to solve all the questions of compound interest by the rules of common arithmetic. The use of logarithms will make the calculation an easy and pleasant work, and all questions about compound interest and rabate as well as those about annuities, their value for any time, present or to come, are solved with the greatest facility.

Whoever has been at a loss in solving a question concerning the sale or acquisition of real estate for a great number of years, the examination of the regulations and premiums of life insurance companies, the sale or purchase of annuities, &c., will acknowledge the great utility of the following proportions, given by Dr. Edm. Halley, a celebrated mathematician.

I. and II. Compound Interest and Rabate of Money. $m=pr^t$; $r^t=m\div p$; $p=m\div r^t$.

III. Annuities, their present worth, not paid as due or purchased to be paid for time to come.

1. $z=\frac{ar^t-a}{r-1}$ 2. $z+\frac{a}{r-1}=\frac{a}{r-1}\times r^t$

3. $a=\frac{z\times r-1}{r^t-1}$ 4. $\frac{z}{a}-1=\frac{z}{a}r-r^t$

IV. 1. $z=\frac{a}{r-1}-\frac{a}{r_t\times(r-1)}$

2. $r^t=\frac{a}{\frac{a}{r-1}-z}$ 3. $1-\frac{1}{r^t}:z=r-1:a$

4. $\frac{a}{z}-\frac{z+a}{z}=\frac{t+1}{r}$

I. Compound Interest.—Let p be any sum of money forborn t times—years, months, weeks or days; r the rate of interest, or one dollar and its increase by interest in one time; m will be the amount of p forborn t times at the rate of r compound interest. Because 1 becomes r in one time, r will become rr in a second time, and r^3 in a third time, and so on, so that if r is raised to that power whose index is t (the number of times;) r^t multiplied by p, (the principal sum,) will be the amount of p forborn t times at the rate of r compound interest.

1. $m=pr^t$. What is the amount of $275 forborn 33 years at 6 per cent. per annum compound interest?

$p=275$ log. r (1,06)=0,0253059
$t=33$ multiplied by t (33) 33
$r=1,06$ Log. r^t= 0,8350947
Log. p= 2,4393327
Log. pr^t= 3,2744274

whose number is 1881,167= $1881·16

2. $r^t=m\div p$.—What is the rate of compound interest, when the sum of $275 forboru 33 years amounts to $1881·167?

m=1881·167 from the Log. of m=3·2744274
p=275 subtract the Log. of p=2·4393327
t=33 Log. $m\div p$=0·8350947

which, divided by t (33)=Log. r=0·0253059 whose number is 1·06; and the rate therefore 6 per cent, the increase of 1.

3. $r^t=m\div p$.—In what time will any principal sum amount to its double value at 6 per cent. compound interest?

Say m=550. From Log of m=2·7403627
p=275 subt. the Log. of p=2·4393327
r=1·06 the remainder 0·3010300

divided by Log. of r=0·0253059 quotes the number of years=11·896, that is, 11 years 317 days.

4. $p=m\div r_t$.—What is the principal sum that will amount to $700 in 20 years at 6 per cent. compound interest?

m=700 r=1·06 t=20
From the Log. of m=2·8450980
subtract the Log. of r=0·0253059
multiplied by t= (20)=0·5061180
the remainder is Log. p=2·3389800

whose number is 218·2630 that is $218·26

II. Rabate of Money—After the same proportions the Rabate of money is calculated, for if in any time r becomes 1, in the same time 1 will become 1 divided by r, and in a second time 1 divided by r^2; in a third time 1 divided by r^3, &c.; and so let p be the value or present worth of any sum, m, to be paid after t times, at the rate of r, and we have the same proportions as before

$m=pr^t$ $r^t=m\div p$ $p\times m\div r^t$

[To be continued.]

A New Kind of Locomotive.

At the late fair of the Maryland Institute, a gold medal was awarded to a locomotive engine exhibited by Mr. John Cochrane, the constructing engineer of the Union Iron Works of Baltimore. The chief peculiarities of this engine consist in the use of a double set of cylinders and driving apparatus, together with an arrangement of the axles whereby the motion over curves is greatly facilitated. The inventor thus describes it:

"The wheels of the Binary engine may be considered as divided into two sets, viz:—Front and back drivers, each set being operated by a separate pair of cylinders, making four cylinders in all. The pair of cylinders beneath the smoke box operate the truck drivers by means of cranked axles, and the outside pair the back drivers by means of crank pins in the wheels. Each pair of cylinders with their connections and wheels form a complete system, but are not capable of independent movement, for both systems are so combined together as to secure a simultaneous action in starting, working, and stopping, and in all the various manipulations necessary to the management of the engine. This is accomplished by combining the outer and inner cylinder of each side respectively, by means of one steam chest and valve,—which produce a perfect unity of action in both systems."

Anthracite Coal Burning Locomotives.

The Philadelphia *Ledger* describes the successful experiment made with a coal-burning locomotive, built by Mr. Phleger, at the machine shop at Tamaqua, Pa. The cylinders are 10 inches diameter, stroke 24 inches, weight 25 tuns; 4 driving wheels 5 feet diameter, truck wheels 30 inches diameter; furnace 44 inches long by 33 inches wide; boiler contains 657 square feet of fire surface, 125 tubes, 9 feet long by two inches diameter.—The fire is blown by a fan which is driven by the exhaust steam, and can be used at pleasure while the engine is standing still. The bottom of the furnace is formed by a water bottom with no opening, which is a great feature in his improvement; a projecting water way which protects the tubes (the coal never coming in contact with the tubes,) forms an air chamber in which gases are consumed.

The cylinders are placed midway of the cylindrical part of the boiler. The hight of the top of the boiler is only 54 inches from the rail.

A series of trial trips were made on the Philadelphia and Baltimore road, between Gray's Ferry and the Susquehannah River,—and in making the round trip to the Susquehannah and back to Gray's Ferry, 125 miles, only consumed 4000 lbs. of coal.

Richmond Mechanics Fair.

The *National Intelligencer* states that the late Exhibition of the Mechanics Institute of Richmond, Va., was very successful, and did great credit to the exhibitors. Wm. H. Macfarland delivered an address before them on the occasion, in which he made suggestions which are good for any region, namely, "that mechanics should do their duty to themselves by supporting their institutes, now exhibiting such triumphs of art, and by cultivating the mental and moral faculties with which they are so richly endowed."

Filtering Air in the Preservation of Meat.

The last number of the *Journal* of the Franklin Institute contains a translation from the *Annales de Chimie et de Physique* in relation to a new method of preserving meat from putrefaction, by Messrs. Schroder and Dr. Dusch. Two portions of meat were boiled in separate glass globes, and the water let out of them, after which air was passed into one through cotton (thus filtering the air,) then sealing the globe; and common air without being so filtered, was then admitted into the other, which was kept open. In two weeks the meat in the open globe was perfectly putrified, while at the end of twenty-three days, the meat in the globe containing the filtered air was found fresh. A number of experiments were made with the same results from the 9th of Feb. 1853 to ths 14th of May, but some experiments made afterwards during the warm weather, with boiled milk, and with meat heated in a sand bath, failed to give satisfactory results—they putrified as quickly in filtered air as in open globes. The authors, however, stick to the positiveness of their discovery, that boiled meats can be preserved by keeping them in air filtered through cotton. They say "certain spontaneous decompositions of organic substances appear to require for their commencement and completion only the presence of atmospheric oxygen, such as the putrefaction of raw meat, and the caseine of milk. In other phenomena of fermentation and putrefaction, it is not only the oxygen which acts, but also certain unknown elements of the air which may be eliminated by filtering through cotton." Thus they make a theory to suit themselves respecting the use of filtered air, and talk of unknown elements in it without having exhibited a single fact in proof of the existence of such elements. The closeness of the vessel may have prevented the air from acting upon the meat in the one case, or it may be that the passing of the air through the cotton screened it of minute insectoria, but be that as it may, there is nothing in it all to invalidate the established scientific fact, that it is the oxygen of the air, filtered or not, and nothing else, which, in combining with organic substances—boiled or unboiled—causes decomposition or putrefaction.

The Dead-Head System on Railroads.

We are glad that the facts concerning this system have been partially revealed to the public and the shareholders. An investigation made on the Erie Railroad shows that of the immense number of 'dead-heads' passed over the road, the regular fare of whom would pay the Company $160,000 a year, less than one in a hundred were members of the press. These facts show that the abuses of the system do not come from our own profession, and we are glad to make the record, for in all the clamor about 'dead-heads,' the press has been counted the foremost among the favored ones.

One of our cotemporaries, in referring to these facts, says:—

"There is no doubt that the 'dead-head' system has been abused beyond mercy, that the stockholders have been robbed through the misgovernment of selfish or unprincipled directors. But we believe that it will everywhere appear that the editors have made the least use of this kind of favors of any other class. We believe, however, that stockholders, so far from being losers by such a small investment, would be greatly the gainers, even if they caused to be added to the free pass of editors some additional inducements for them to use them frequently. Free tickets of all kinds are so common to the press that they set little value upon them, because they are generally expected to render more in return than they receive. It is time that this subject was better understood, and that the press, which renders a full equivalent for what it receives, and often much more, did not shoulder responsibilities for whole regiments of the mere pets and cousins of railroad directors.—[American Railway Times.

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British Association for the Advancement of Science.—No. 4.

[Concluded from page 67.]

Preceding this, we have presented three articles containing abstracts of the proceedings of the above named association, at their recent annual meeting in the City of Liverpool; the present article will finish the series.

DIAMONDS—Prof. Tennant read a paper on this subject giving a particular description of the Koh-i-noor, or great crown jewel of England, but which a few years ago was the property of Runjeet Singh, of India, who on being conquered by the British, paid it as a price for peace. This famous jewel, respecting which there had long been associated the idea of power in the minds of the natives of India, appears to be neither so large nor valuable as has been supposed. It originally weighed 787½ carats, but had been broken, and there is now a portion of it in Persia which weighs 130 carats, while the other portion now in England weighs but 122 carats. When it arrived in London, however, it weighed 186 carats, but was reduced to its present size by re-cutting; its former shape being clumsy, and not exhibiting its fine qualities to advantage. Its value is £83,282 (about $416,000.) There is a gem in France which weighs 139 carats, and cost £130,000. and is named the "Pitt Diamond." The question was asked of Prof. Tennant, "if it was true that the Koh-i-noor, after being exposed to the rays of the sun, retained its luminosity when put into a dark place," he answered that it did retain this luminous quality, as all diamonds did, for a few minutes, but a lump of crystallized sugar, when exposed to the sun's rays, also exhibited the same brilliant hues for a short time, if immediately placed in a dark situation. This is a fine finale, we think, to the old opinion respecting the power of the diamond in shedding beams of light in the dark.

CYANIDE OF POTASSIUM ON INSECT LIFE—Mr. Buckton read a paper on the application of cyanide of potassium for the killing of insects, for cabinet. After many experiments, he had tried this substance with complete success. Twenty or thirty grains of it were placed in a glass jar, fitted for the purpose with a brass cover. Into this jar the insects were introduced, and the cyanide gave off enough of gas to take their lives in a short time. The effect of it at first was to produce intoxication, the insects turned on their backs, then a violent nervous action took place, and death occurred in about four minutes. During a conversation which took place on this paper respecting cruelty to insects, Dr. Lankester maintained that the lower classes of animals and insects, from their conformation, were unsusceptible of feeling pain. Dr. Laycock, while he thought it could be proved they had no succeptibility of pain, he was convinced they had the sense of enjoying pleasure.

STEAM NAVIGATION—J. Scott Russell read a paper on this subject, always a favorite one with him, and of no less importance to us — He stated that the old tunnage laws of England, which taxed vessels according to their greatest breadth, compelled the merchants to build long, narrow wall-sided ships, like water warehouses. Now breadth was what a vessel required to stand up; to make the old vessels do this, they required a great deal of ballast in their bottoms, or else bolsters under their sides. The vessels which were built now had an increased breadth of water line, and this gave them greater stability on the water. Ships were now made very sharp and had a great depth of keel, or what is called "hold on the water," to prevent going to leeward. When he was learning to draw a ship, he was told to make her greatest breadth about one third from the bow, give her a long tapering stern, and a bluff duck-like bow to make her stem the water. After the old tunnage law was abolished he tried many experiments, and had great difficuly in obtaining the best shape to get the greatest speed for ships, with the least resistance. The old bluff bow knocked the water away violently, but by giving the ship a long hollow bow and a comparatively short stern on the water line, the water goes out of the way easily and gently, and the ship slides away rapidly. Instead of the greatest breadth being near the bow, as of old, it was now nearest the stern; this was the principle on which the lines of the American clippers were built, and upon which all clipper ships should be constructed. There was another important question connected with that of the long bow in vessels; he was bred with the idea that nine miles per hour was the limit of steamboat speed. Short bluff vessels used to be built, into which a great deal of engine power was placed, and in one instance of an admirality steamer, the engines were taken out and others of one-half greater power put in, but the vessel made only one quarter of a mile greater speed per hour, because the quantity of water carried before the bows was greatly increased. The increase of a vessels speed depends on the long bow, and the rule is according to the square of its length.—Thus a vessel of fifty feet long, for an eight mile speed per hour, required a bow twenty-four feet in length; and if it were required to double this speed (sixteen miles) the entrance would have to be about ninety-six feet (4×24 =96.) He believes they could not get a vessel to go sixteen miles per hour without a length of one hundred and eighty feet. The *Himalaya* was a proof of the great advantage of length, viz: 350 feet; the same thing was observable in the large American clippers; they could get greater speed out of them with less canvass and spars. In India they had discovered this long ago, and they had very fast boats there. The Americans made very early experiments on their steamers, and added long hollow bows to what were previously short ones.

Another important thing in the progress of naval architecture, was the increased size of ships. Some say, "Oh you are going too far in the size of your large ships, as with an increase of size the same degree of strength cannot be obtained." This may be true of wooden vessels, but not of iron ones. Mr. Fairbairn had discovered a method of fastening iron plates so strongly together that they will give way anywhere but at the seams.—The Eastern Steam Navigation Company got their charter for the purpose of improving upon the existing state of ocean steam navigation, and the first question they asked of shipbuilders was, "how can we make steamships go faster?" One said, "put more power into them," but they found that alone would not do, and at last M Brunel drew out plans for the monster vessel now building.—Brunel was the first person who designed a steamship large enough to cross the Atlantic with regularity and speed; this was the *Great Western*, which is now performing services as efficiently as when she first went to New York. The monster new ship is to carry six thousand tuns of goods, five hundred first class and one thousand steerage prssengers, and is to reach Australia in about thirty-three days.

Mr. Russell went on to remark concerning the national idiosyncrasy which prevented the people of England from at once adopting anything that was new and untried, and contrasted this with the progressive spirit displayed by the Americans. "If there were two plans," he said, "for doing the same thing, the English would rather try the old one than the new, even if the new were a little better, but Brother Jonathan would rather try the new than the old, even if both were equal." Mr. Russell's address was received with great applause, and when he sat down Mr. Fairbairn arose, and said, he at first doubted whether a ship of such an immense size as that described by Mr. Russell, could be built of sufficient strength, but having been favored by Mr. Brunel with a private view of the drawings and plans, he had now no doubt as to its strength. When a tube like that of the Britannia Bridge, 460 feet long, could be supported from one pier to another, and carry a railway train rapidly through it, we need have no fear of a ship, which will have the water to support her whole length.

We really wait with some intensity of feeling the completion and trial of this monster steamer. When loaded, she will draw about sixty feet of water, and is the grandest nautical enterprise on record.

Improved Stump Extractor.

An improvement in machinery for extracting stumps has been invented by Edward Vaughn, of Alliance, Ohio, who has taken measures to secure a patent. The bearing of the screw employed in this stump extracter is a half sphere fitted within a concave plate; the hub of the sweep for working the extracter has a projection resting upon anti-friction balls, and the screw passing through a recess, is so arranged that the friction usually attendant on operating it in ordinary stump extractors, is greatly reduced, and at thesame time the screw is allowed to oscillate and conform to the line of pressure when out of a vertical line. This machine is made with a frame to be drawn on wheels to the field where the stumps are to be extracted, and is made with devices whereby the wheels can be very readily attached and detached. There are also some other improvements embraced in this machine relating to the simplicity and convenience of the working parts, such as the blocks and levers, &c., a correct idea of which cannot be communicated without engravings. The freeing of fields from stumps is a desirable object by every farmer, as they prevent land from being properly plowed, and also occupy, uselessly and uncouthly, a great deal of valuable space. But hitherto the extracting of stumps has been such an expensive operation that farmers of moderate means have not been able to employ such machines. We hope this improvement in simplifying and rendering more effective stump-pulling machinery will be the means of lessening the expenses of the operation, so that all our farmers will be able to get their lands cleared of stumps easily and cheaply, and will consider such a method of clearing up farms as necessary as the logging-up of fallen timber.

Looms for Weaving Bags.

A very excellent improvement has been made in looms for weaving seamless bags, by George Copeland, of Lewiston, Me., who has taken measures to secure the same by patent. This invention does not change the general character of the loom, from those commonly employed for weaving plain or twilled fabrics, but consists chiefly in certain modes of constructing, arranging, and operating some of the parts which require to be duplicated. A loom constructed according to this invention requires two sets of harness, either for plain or twilled weaving, according as a plain or twilled bag is required, and all the mechanism necessary to operate the two sets of harness independently of each other. It also contains two shuttle races placed one above the other in front of the same reed, and employs two shuttles, which are both in operation at all times. In weaving a bag, though only one warp is used, two independent sheds are opened one above the other, and the two shuttles follow one another through the upper and lower sheds, and thus produce a fabric composed of two parts united at the edges, one-half of the warp from which the upper sheds are formed, composing one-half, or one side of the bag, and the other half from which the lower sheds are formed, composing the other half of the bag, the two parts of the fabrics thus formed only requiring to be united at certain intervals, corresponding with the required depth of the bags, to form a continuous web of bags, which, when finished, only requires to be cut across at proper intervals to separate them. The bottoms of the bags are formed without any stoppage of the weaving, by the harness. and all the changes are effected by mechanism which works with the loom, the whole being self-acting.

Grease Feeders.

An improvement in grease feeders for lubricating cylinders and valve seats, has been made by John Sutton, of New York, which consists in a novel mode of combining a cylinder and piston, and a stop cock or its equivalent, and a grease reservoir for the purpose of injecting the lubricating material i to a cylinder against the pressure of the steam, or into any vessel subject to the pressure of a gas or a fluid. A small cylinder is placed below the grease reservoir, and has communion with the cylinder to be lubricated, through a stop cock, by one passage, and by two small side passages near the end of its piston stroke, with the grease reservoir. When the stop cock between the feed cylinder and the steam cylinder is closed, and the small feed plunger is drawn up, the grease or lubricating material flows down under the piston—a vacuum being created under it—and then by opening the stop cock and pushing down the feed plunger, the oil or grease is forcibly injected into the steam cylinder. This lubricator has no valves, and is therefore very simple in its construction and operation. Measures have been taken to secure a patent.

Carriage Cramp.

The common cramps of wagons and carriages consist simply of strips of metal nailed to the bottom of the box or body of the vehicle, to prevent the wearing of the wooden part where the wheels come in contact with it in the act of turning. As a superior mode to this, Samuel T. Sanford, of Fall River, Mass., has made an improvement by constructing the cramps with anti-friction rollers, so arranged that when the wheel comes in contact with them in the act of turning, they obviate the great friction of the common cramp, and at the same time prevent the vehicle from being overturned.

Lathes for Turning Fancy Chair and Table Legs.

Many improvements have been made on lathes for turning irregular forms, and as the business of turning table and chair legs, and other like fancy articles of furniture, is carried on very generally and extensively in our country, every improvement in such machines is of no small import. An improvement in lathes for such kinds of turning has been made by Luther Wentworth, of Burlington, Iowa, who has taken measures to secure a patent. In this lathe the stick to be operated on does not revolve as in other lathes, but is moved longitudinally towards and through a revolving hollow mandrel, which carries the cutters to reduce the stick to its proper size and form.

The cutters are so arranged as to be thrown in and out of operation, by which the stick can be acted on at intervals, at different parts of its length. Near one end of the mandrel there is a saw for cutting off the articles the proper length from the sticks as they severally emerge from it.

Mortising Machine.

R. P. Benton, of Rochester, N. Y., has taken measures to secure a patent for an improvement in the feeding of the stuff into mortising machines, whereby mortises may be cut in stuff the required length and depth by self-acting devices, which receive motion from the shaft of the cutter. There is a rotary screw rod operating upon a slide, and an adjustable crank which gives a reciprocating motion to the bed on which the stuff is fed in, the latter being so adjusted that the cutter will operate upon the stuff to cut the required depth and length of mortise and no more. This mortising machine may be attended by a boy; in practice it has operated well.

Water Filters.

O. Saulay has made the following improvement in filters, for which he has taken measures to secure a patent. A suitable cylindrical vessel is divided into two filtering parts, one of which contains charcoal dust and the other clean sand, &c., for purifying the water. The water is admitted at the bottom of the vessel, and flows upwards and over the top, and falls pure and limpid in a reservoir. The impure and foreign substances can in this manner be washed out at the bottom in a concentrated state, with very little water, thus affording an easy means of keeping the filter in a proper condition for purifying the water.

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New Inventions.

Improved Spike Machine.

On the 2nd of August last year, a patent was granted to R. Richardson, Jas. Westerman, and Ebenezer Wilder, of New Castle, Pa., for the improvements in machinery for making wrought iron spikes, represented in the accompanying engravings.

Figure 1 being a plan view of the machine. Fig. 2 being a side view—the side pieces of the frame being removed. Fig. 3, a perspective view of the cam by which the header and pointing rollers are operated; and fig. 4 a section showing the griping jaws closed, and the pointing rollers moved the extreme length of their vibration, leaving the point of the spike formed. Similar letters refer to like parts.

A represents the frame of the machine, on one end of which there is a shaft, B, supported by uprights, C C. On this shaft, B, there are placed five cams, D E F G H, which, as the shaft rotates, communicate motion to the working or moving parts of the machine.—The cam, F, placed at about the center of the shaft, B, works the lever, I, the lower end of which is attached to a rock shaft, J, having its bearings under the upper side pieces of the frame (see fig. 2;) the bearings are not represented, but the exact position of the rock shaft is shown. The upper end of the lever, I, is made to bear against the cam, F, by means of the spring, K. To the lever, I, is attached a jaw, L, an under die, M, a roller carriage, N, and its bed, O.

The jaw, L, is merely a horizontal metal plate, and the under die, M, is secured to its outer end, a short distance below its upper edge. P is also a jaw, secured permanently to a stationary top, Q, directly opposite the jaw, L. The stationary jaw, P, is similar to jaw L. These jaws seize the spike back of the part on which the pointers act. The upper and lower dies, near the point end of the blank, are made wider than the blank, and spread out over a portion of the disks of the pointing rollers, and rest thereon during the operation of pointing. The blank is compressed by the dies to the precise thickness of the pointing rollers before the rollers move to give the point. These dies resting above and below against the disks of the pointing rollers, form, as it were, grooves for the rollers to work in, against the sides of the blank; and as the dies rest upon the disks there is no space between the dies and disks for the formation of a pin or feather upon the spike,—whereas, if the dies were narrow or did not rest on the rollers, the blank would be spread while the point is forming, producing fins and ruining the spike—a defect which has heretofore rendered roller-pointers worthless. Die pointers cannot produce long points for ship spikes, and as the rollers have failed in consequence of the fins, &c., the points of such spikes have hitherto generally been made by the hand hammer—or sometimes means have been taken to remove the fins. But these difficulties are all obviated by the construction of the dies in combination with the rollers for pointing. To the stationary stock, Q, is secured a bed, R, on which a carriage, S, works. The bed and carriage on the lever are precisely similar to the bed and carriage on the stationary stock, Q. T T are rollers placed in the sides of the carriages that face each other. These rollers sre distinctly seen in figures 1, 2, and 4. U is a holder attached to a vibrating arm, V, having its fulcrum or pivot, *a*, secured to the lever, I. The holder, U, is bent at its outer end to fit the blank, and presses upon it on two sides, and retaining it upon the under die, M, and against the jaw, L, while the spike is being cut the required length. The vibrating arm, V, is connected to a spring, W, by a rod, X; the spring, W, being operated by the cam, D, to raise it when the spike blank has been cut and carried against the jaw, P. Y is a lever having its fulcrum at Z, and operated by the cam, E.—An upper die, A', is attached to this lever, Y; the upper die pressing upon the spike directly over the rollers, T T, when the jaws gripe the blank. This die is in two parts, with a space between to allow the holder to rise when the blank is griped. B' is a header attached to a shaft, C'. The header is constructed in the usual way, having a recess in its end, to form the head of the spike. D' D' are toggles connected to the carriages, N S, and by arms to the shaft, C'. E' is an arm, the lower end of which is connected to the shaft, C', and the upper end bears against the cam, H, by means of the spring, F'. G' is a guide, having a loop, *b*, at one end, through which the rod of which the spikes are formed, is passed. Against and across the end of this loop, or on its outer edge, a knife, H, works; said knife passing over the outer edge of the loop and cutting off the rod. The knife, H', is attached to a lever, I', which is operated by the cam, G, the lever, I', being pressed against the cam by means of the springs, J', see fig. 1. The cutter, while operating, has the same

SPIKE MACHINE.

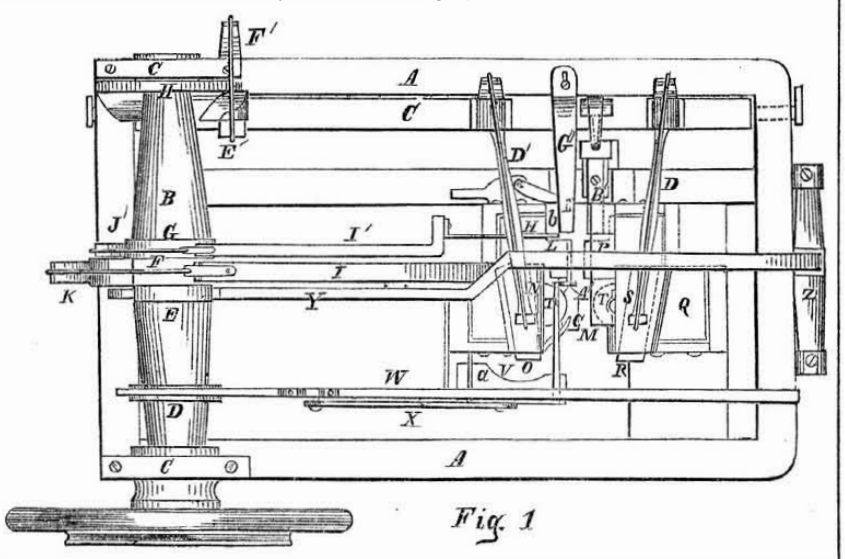

Fig. 1

motion with the jaw, L, and under die, M, the blank is thus carried over uniformly.

Operation—The rod of which the spikes are formed is passed horizontally through the loops, *b*, and upon the under die, M, and is stopped at the desired point by a gauge, *c*, connected with the pointing carriage. Motion being given to the shaft, B, the cams, F G, operate simultaneously upon the levers, I I', and the knife, H', passes over the outer end of the loop, and cuts off the rod, a space being left between the outer end of the loop and the ends of the jaws, in order that a sufficient length of rod may be left to form the head of the spike, the movable jaw and under die moving with the knife. When the knife, H', begins to cut the rod, the holder, U, is pressed down upon it, and holds it firmly against the under die, M, and jaw, L, the holder being operated by means of the cam, D, operating upon the spring, W. When the rod is cut off by the knife, H', the cam, G, has reached its highest point. The cam, F, still operates upon the lever, I, and continues to force the jaw, L, and carriage, N, with its roller, towards the stationary jaw and roller, until the spike, or rather the piece of rod of which the spike is to be formed, is pressed between the two jaws, L P. The holder, U, now rises, and the movable upper die, A', descends, and presses firmly upon the piece of rod, and also upon the upper sides of the pointing rollers, the lever, Y, to which the die, A', is attached, being operated upon by the cam, E. The cam, H, now acts upon the lever, E', and the shaft, C', is turned in a direction towards the jaws, and the toggles, D' D', move the carriages, N S, with the rollers,

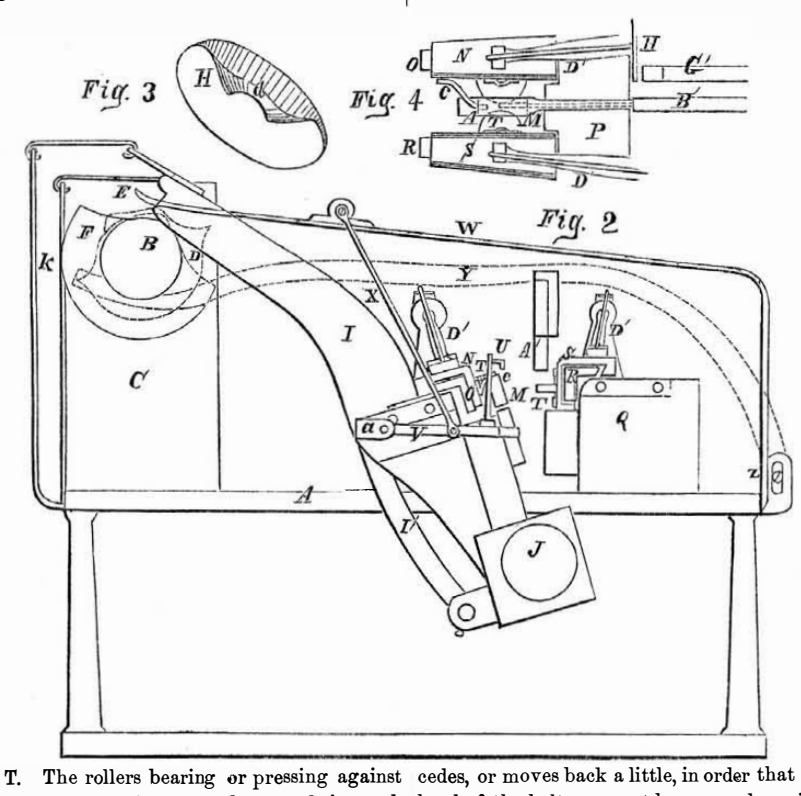

Fig. 3 Fig. 4 Fig. 2

T T. The rollers bearing or pressing against the rod, and being moved towards its end, form the point of the spike, because the beds, O R, of the carriages are set oblique with the rod (see dotted lines in figure 1,) and the rollers, as the carriages are moved, are brought gradually together, till they come near or quite in contact, the gauge moving with the carriage out of the way of the point. It will be seen that by placing the beds more or less oblique, a long or short point may be obtained. The header, B', is also moved simultaneously with the carriages, and the header presses against the end of the rod and forms the head of the spike. The header then recedes, or moves back a little, in order that the head of the bolt may not be pressed against the ends of the jaws, and prevent them from parting, but still retaining the head freely.—This is accomplished by the peculiar shape of the cam, H (see figure 3.) When the highest point of the cam has acted upon the lever, E', the lever, as the cam moves, falls on a slightly depressed part of the cam, which continues for some distance, and the header, B', is moved back sufficiently to relieve the jaws but retains the head until the die and jaw are removed from the shank. After the point of the spike is formed, the levers, I I', are moved back, their cams having passed the highest points; and the jaw, L, and carriage, N, are consequently parted or moved from the stationary ones; the upper die, A', is also moved upwards. The spike being completed and the header withdrawn, it falls between the two jaws, and the several parts above described are again ready for operation.

This machine makes excellent long pointed spikes for ship building. One of these machines has been in successful operation in Bath, Maine, for some time, by J. T. Patten & Co., and the patentees are building another for the same firm. More information may be obtained by letter addressed to Messrs. Richardson, Westerman & Co., New Castle, Pa.

Improved Expansible Bit.

The accompanying figures represent an improvement in Expansible Bits, for which a patent was granted to Clinton L. Adancourt, of Troy, N. Y., on the 27th of August, 1851, but which is now for the first time prominently brought before the public.

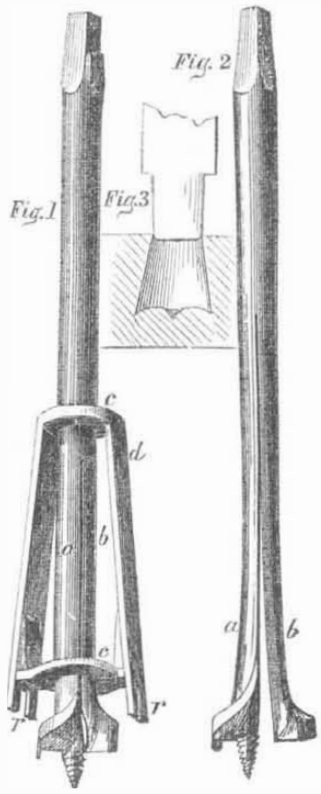

Fig. 1 Fig. 3 Fig. 2

The nature of this improvement consists in making expansible bits for boring conical holes any given distance into the material, and chip the core so that it is discharged from the hole without the necessity of boring through the material, and so forming it that tenons may be firmly wedged into mortices, enclosing the tenon entirely.

Fig. 1 is a perspective view of the complete expansible bit; fig. 2 is a view of the bit itself fully expanded, without its collar, and fig. 3 is a section showing the form of conical hole made with the bit, and also the manner of wedging a tenon in it.

A bit or auger is formed in the usual manner and then divided longitudinally into two unequal parts—the larger part, *a*, having the center, and the other part, *b*, operating on a spring, at the point of which is the expanding cutter. The collar, *c c*, is then placed upon the shank, and presses the two sides of the bit together. This collar has wings, *d*, and projecting points, *r r*, extending down to the line of the cutting points of the bitt. When the bit is brought into operation these points, *r r*, rest upon and are held firmly against the material to be bored, therefore as the bit progresses or bores into the timber, the collar is pushed upwards, freeing the bit and allowing it to expand gradually, to form a conical hole, as shown in fig. 3, in which a tenon can be wedged neatly and permanently—impossible to be drawn apart or work loose. For very deep boring an extra collar (forming a tube placed around *a b*, and embraced by *c c*) is employed, and the claim of the patent covers the expansible bit in combination with a single or double collar constructed and operating as described.

Warren Gale, No. 4 North Market st., Boston, is agent, more information respecting this excellent tool may be obtained of him by letter.

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Scientific American.

NEW YORK, NOVEMBER 25, 1854.

Is it Worth Patenting?

This inquiry is very properly the first which arises in the mind after an invention is matured. If the expense of applying for a patent was very great, it would, of course, be an act of imprudence to take such a step without being satisfied that the pecuniary outlay was certain to be returned. The cost, however, under the United States laws, is so small that no inventor should hesitate on that score.

The sale of rights for the paltry sum of *two dollars a State*, without mentioning profits on the article itself, would generally leave a profit above the actual sum paid to secure the grant. But that invention must be a barren one indeed which would not bring $100 a State, or $3,000 for the country. The records of the Patent Office show that the sales of some of the most unpromising patents—such as those for straw cutters, churn dashers, seed planters, and the like, with which the country is always, apparently, over-stocked—generally realize to their owners, from thirty to sixty thousand dollars each. This is an average of between one and two thousand dollars per State, the aggregate forming a comfortable fortune in these hard times. We have a fresh illustration at hand. A portion of the right for Gale's patent straw cutter—an excellent invention, by the way—was sold, quite recently, to a highly enterprising Eastern firm, for the sum of *thirty thousand dollars*, the patentee to receive, in addition, a percentage on all profits above a certain sum.

Inventors should take encouragement from such facts, not only to secure their discoveries by patent, quickly, before any one else steals a march on them, but also to be as industrious as possible in inventing. The more patents they can secure the better.

In an educative point of view the inventor also reaps important advantages by patenting his inventions. They stimulate his mind to greater and greater exertion, thus gradually producing that vigorous growth and expansion of intellect which underlies the true happiness of man.

Not so is it with the inventor who allows his ideas to die in his own bosom, without developement or official record. Soon he loses all personal interest in them, and the fire of his genius, instead of being replenished and increased by pleasurable effort, becomes unworthily smoldered, and finally extinguished. His name is never enrolled among that proud galaxy of worthy men, who, while endeavoring to improve their own conditions, have, at the same time, benefitted their fellows.

Dangers of the Sea—Courts of Inquiry.

There is something terribly impressive in the thought of hundreds of our fellow creatures being suddenly engulfed beneath the wild waters, far from the hearts and homes of loving kindred, with the scream of the tempest for their requiem, and the sea foam for their winding sheet. No monumental stone points out the graves of ocean, and no soft footsteps can ever wander there to muse in sad remembrance over the lost and loved. During the past year death has been very busy on the "great deep." Calamity has followed rapidly upon calamity, and the moanings of shipwreck has floated upon almost every surge that has beat upon our shores. The *San Francisco*, the *City of Glasgow*, and the *Arctic*—large and powerful steamers—all went down far out on the ocean, and with them nearly a thousand human beings. Our dangerous coasts, too, have been strewed with the fragments of many noble ships, and hundreds have found watery graves within sight of the very land which they so much longed to behold "when far away on the billow." In view of these sad events, a voice seems to come up from the ocean making inquiry of the living for the blood of the dead.

Accidents have taken place (and will do so again) under circumstances where skill, caution, and good behavior availed but little, but it is equally true that far too many sad accidents have been caused by recklessness, cupidity, or want of capacity. It is generally believed that it was a most reckless act to proceed to sea with the *San Francisco*, and there are few who do not believe that all on board of the *Arctic* might have been saved by good management and behavior. Late news from the Pacific bring accounts of a noble steamer, the *Yankee Blade*, being run on a rock and wrecked, the dauntless captain deserting her in the first boat, and his first officer in the next, leaving hundreds of passengers on the wreck, and the faithful third mate, who like St. Paul, abode by the ship to the very last. The passengers were nearly all saved afterwards, but no thanks to the commander who deserted his post. On Sunday night the 12th inst., the ship *New Era* went ashore on Deal Beach, N. J., and in this case also, the first that left the ship were the captain and his crew, leaving 400 passengers to the fury of the waves, and of that number 250 perished within sight of the shore. It is our opinion that the most careless commanders of ships have also the least bravery and capacity for management in the hour of danger. When it is considered that the lives of so many who do not know their right hand from their left in nautical matters, are entrusted to the care of commanders of vessels, the greatest discretion should be exercised in their selection. Those two captains who deserted their vessels so precipitously, leaving the poor passengers to drown and die, have left a dark blot on the escutcheon of our American marine. Every means which sagacity can devise, should be provided for the prevention of accidents at sea. Life boats and life preservers are but forlorn hopes. We rejoice to be informed—as we strongly recommended—that the *Pacific* and *Arabia* steamships were provided with new and large steam whistles before they sailed on their last voyages. These will be heard at five or six miles distance on the sea, giving warning of their approach in fogs. But with every appliances to provide for emergencies, the grand means for the safety of vessels are able and faithful captains and sailors. This we apprehend will not be disputed, and we think it would be well if some law were passed by Congress for the examination and inspection of our merchant marine corps. There is one other measure which we would particularly recommend to the attention of Congress, that is Courts of Inquiry for our merchant commanders, as well as those of the Navy. We believe that such courts would be the means of doing much good. When a vessel of war is lost, no matter by what cause, a Naval Court of Inquiry is instituted, and all the facts in the case are brought to light. If the loss has been caused by misconduct, then justice and judgment award the proper punishment; and on the other hand, if the loss has been caused by circumstances over which the officers could exercise no control, such a trial wipes out all doubt and darkness from the public mind, and does justice to the brave and the faithful. We believe that such Courts of Inquiry for our mercantile marine would be the means of elevating its character—something which appears to us to be much required at the present time.

Sanford's Patent Straw Cutter.

This machine is manufactured by J. A. Burns, Carthage, Ohio. It is one of the most simple and effective machines for the purpose now in use. We have frequent inquiries for such machines from western subscribers who desire to purchase nearer home.

New Brick Machine.

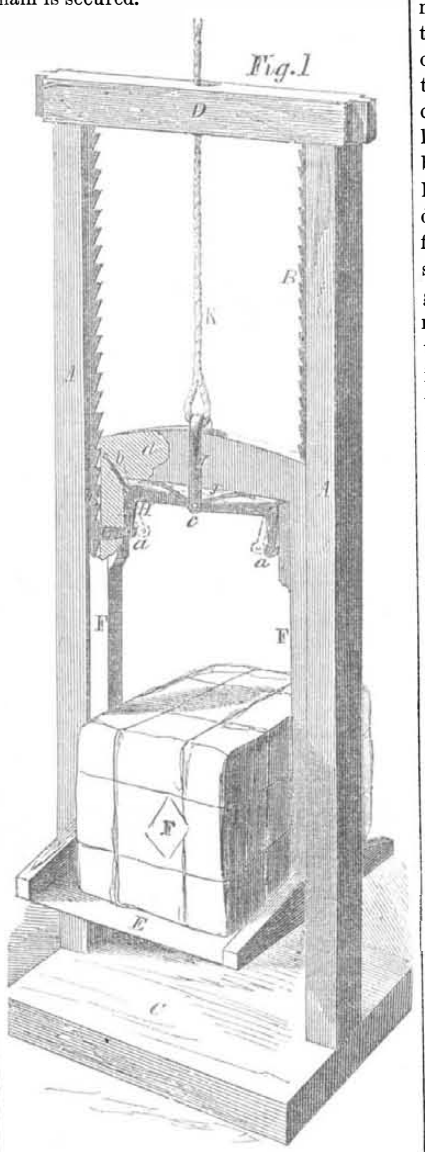
Among the patents lately granted was one to Loomis E. Ransom, Havana, Ohio, for improvement in brick molding machines. The inventor reports that he has lately made a thorough trial of the bricks thus molded, and that they come from the kiln equal to the best. He further states that with one apparatus costing only five dollars, one man can mold from 10 to 12,000 bricks per hour.

Otis' Improved Elevator.

The annexed figure is a perspective view of the improved Elevator of Elisha G. Otis, of Yonkers, N. Y., who has taken measures to secure a patent for the same.

The nature of the invention consists in having a platform attached to a frame which works between two vertical racks, the upper part of the frame having pawls passing through it, which catch into the racks when the lifting power which is applied to the frame is stopped or taken off. The pawls are attached to bent levers, which levers are connected to a rod to which the lifting rope or chain is secured.

Fig. 1



A A represent two vertical posts, having racks, B B secured to their inner sides. The lower ends of the posts may be secured to a suitable base, C, and their upper ends may be attached to a tie piece, D; E is a platform attached to the lower part of a rectangular frame, F, which frame works between the two racks, B B, the racks fitting in grooves in the outer surfaces of the side pieces of the frame. G G are pawls which are secured by pivots, *a*, to the lever ends of right angled levers, H H, said levers having their fulcra at *b b*. The upper ends of these levers are secured by a pivot, *c*, to the lower end of a rod, I, which passes vertically through the center of the top cross piece, *d*, of the frame, F. J is a spring which passes through the lower end of the rod, I, underneath the cross piece, *d*. The ends of this spring bear against the lower surface of the cross piece. K is a lifting rope secured to the upper end of the rod, I.

The weight or bale to be elevated is placed upon the platform, E, which of course is at the lower ends of the posts, A, and resting upon the base, C. The power is then applied to the rope, K, and the rod, I, is drawn upward and the pawls, G G, in consequence of their attachment to the levers, H H, are withdrawn from the racks, B B, and the frame and platform ascend till the weight is elevated the desired hight. The lifting power then ceases, and the weight or article is taken off.

By the above improvement the pawls are prevented from bearing against the racks during the upward movement of the frame, F, and much friction is obviated thereby, and if the rope should break, or be loosened from the driving shaft, or disconnected from the motive power accidentally, the platform will be sustained, and no injury or accident can possibly occur, as the weight is prevented from falling.

The platform and frame descend by allowlowing the rope to move gently down, the weight of the platform and frame being sufficient to keep the pawls free from the racks,

This excellent platform elevator was on exhibition in the Crystal Palace during the past season, and was much admired.

More information may be obtained by letter addressed to the inventor.

Aerial Navigation.

For some time past a new system of aerial navigation has been exhibited by a model in this city, the invention of E. D. Tippet Esq., of Washington City, an old and respectable teacher and inventor. His plan is to have a condensing reservoir in the car of his balloon, connected with the inlet pipe and the balloon itself by two pipes. When the balloon is inflated, and has ascended, and it is desired to descend to another stratum of air for a favorable or less swift current, it is designed to employ an air pump to draw the gas out of the balloon and condense it in the reservoir, thereby, as he conceives, making the balloon descend by the gas being confined in a smaller space than in the balloon: when he wants to ascend again, he opens a faucet and allows the condensed gas in the reservoir to pass by the inlet tube into the balloon, and thus—by condensing and expanding the gas—arise and descend at pleasure. He also employs two propellers set towards one another, forming an angle of 90° for propelling the balloon. Mr. T. we understand, was deceived by some persons in this City, who in Washington told him to come on to New York, and he would find a company with a capital of $1,000,000, ready to put his invention into practice at once, and so this old and respectable teacher has found himself here—in the wilderness of myriad homes—without means for his proper maintenance. The successful navigation of the atmosphere is something much to be desired, and Mr. Tippett's plan is the best we haveyet seen for effecting this object.

To Some of our Old Subscribers.

We trust that all who receive circulars from us notifying them of the near expiration of their subscriptions, will remit the necessary amount for the continuance of the same, without delay. By so doing they will insure the reception of all the numbers of the volume without intermission, and save us the disagreeable necessity of crossing their names from our books. No person after having once taken the Scientific American, and become interested in its regular perusal, should ever cease to receive its visits. From a habitual study of its pages, the reader derives, beyond all doubt, important and permanent mental benefits, though he may at the time be insensible of special advantages.

We trust that the paltry sum of four cents a week will not lead any of our readers to cut off from their minds the fresh supply of knowledge with which it is our constant endeavor to furnish them. Let them reduce the supplies of the mouth rather than starve their minds.

$570 IN PRIZES.

The Publishers of the Scientific American offer the following Cash Prizes for the fourteen largest lists of subscribers sent in by the 1st of January, 1855.

$100 will be given for the largest list,
$75 for the 2nd, $35 for the 8th,
$65 for the 3rd, $30 for the 9th,
$55 for the 4th, $25 for the 10th,
$50 for the 5th, $20 for the 11th,
$45 for the 6th, $15 for the 12th,
$40 for the 7th, $10 for the 13th,
and $5 for the 14th

The cash will be paid to the order of each successful competitor; and the name, residence, and number of subscribers sent by each will be published in the Scientific American, in the first number that issues after the 1st of January, so as to avoid mistakes.

Subscriptions can be sent at any time and from any post town. A register will be kept of the number as received, duly credited to the person sending them.

☞ See new Prospectus on the last page.

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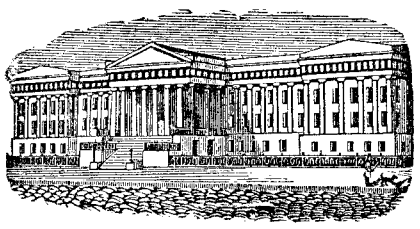

[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office.

FOR THE WEEK ENDING NOVEMBER 14, 1854.

MACHINERY FOR CARVING STONE—Edwin Allen, of South Windham, Conn.: I do not claim to be the first inventor of a machine for carving in which the tracer and cutting tool have their relative motions, not only in a horizontal but a vertical plane, and I do not wish to claim the described combination of pantographs for other purposes than that of carving.

But I claim the employment for the purpose of carving stone and other substances, of two pantographs combined with a tracer, and cutting tool, as described, to wit: the pantographs being arranged at right angles to each other, and having their main pivots connected or arranged in such way as to form or be equivalent to a universal joint, and the tool and tracer being suspended from or attached to the pantograph, O P Q R, and passing through sockets in the legs of the pantographs, A B C D, whereby the tracer and tool are allowed an universal movement, as set forth.

SMUT MACHINES—Levi B. Ball, of Putnam, Ohio: I claim the use or employment of wood and iron slats placed alternately, or of any other hard and soft substances arranged in an equivalent manner, and producing a similar effect, substantially as described and for the purposes specified.

CULTIVATORS—Wm. Bancroft, of Whiteford, Ohio: I am aware that a triangular knife like mine has been used.

But what I claim is the method of making the knife adjustable upon the frame, a, by means of standard, c, and hinged standards, f and g, as set forth.

SLIDE VALVES FOR THE EXHAUST STEAM—Henry Bates, of New London, Conn.: I claim the employment, substantially as described, in combination with the usual slide valve, of a supplemental exhaust slide valve, C, to be operated by separate mechanism to work over a separate series of ports which are similarly arranged to and communicate with the same passages as the usual ports, for the purpose of giving a free exhaust till the termination of the stroke of the piston, and for enlarging the area of passage for the exhaust, as fully set forth.

DOUBLE CYLINDER BOILERS FOR HOT WATER APPARATUS—William Beebe, of New York, N. Y.: I claim the combination of two boilers, one within the other, and two reservoirs, one above the other, arranged with one set of connections with a kitchen range, so that the upper part of a house may be supplied with hot water by means of the upper reservoir, which will derive its supply of cold water either from the roof or from a force pump, while the lower part of the house will be supplied by means of the lower reservoir, which will derive its supply from the public water works.

FURNACES FOR MAKING IRON DIRECT FROM THE ORE—Martin Bell, of Sabbath Rest, and Edward B. Gett, of Cold Spring Forge, Tyrone City, Pa.: We do not claim as our invention the principle involved in the use of close deoxydizing vessels or tubes combined with a furnace for deoxydizing iron ore mixed with carbon, nor the application of the waste heat of a reverberatory or other furnace for giving the necessary heat to the ore vessels or tubes for the same purpose. Nor do we claim the principle involved in the conveyance of the deoxydized ore immediately from the ore vessels or tubes into the furnace, as these discoveries have all been made and applied, as before shown, some years ago. Nor do we claim making deoxydizing ore tubes simply with inclined bottoms, as these have been used before by Dickerson, and also by Renton, as before stated. Nor do we claim the use of an inclined flue bottom, or other open chamber or chambers for deoxydizing the ore, as those have also been used before; nor do we claim combining the forge fire with a reverberatory furnace, as we find this combination also has been used before.

But we claim the series of inclined close deoxydizing tubes or vessels, C, built of common fire bricks, and arranged so as to be parallel or nearly so with each other, and inclined at an angle of about fifty degrees from the horizon, so as to lie or rest their whole length securely upon a substantial inclined base, as described and illustrated, and also so as to be exposed only on the two opposite outer sides of each tube to the action of the escaping heat from the furnace, as it passes along through the intermediating flues, E, the same being combined with the main flue, B, through the opening, F, and with the interior of the furnace, in the manner described, each ore tube having an adjustable cut off, or sliding grate, N, at its lower end, as described, and also combined with a separate horizontal way, M, as described, leading directly into and connecting the said tubes with the bottom of the reverberatory furnace, as described, the whole being constructed, arranged, combined, and operating substantially and for the purposes as described.

LAMP CAPS—Wm. Bell, of Boston, Mass.: I do not claim the use of wire gauze, or perforated tin for the purpose of preventing the explosion of spirit lamps.

But I claim the perforation in the lamp cap in combination with the short chambers of perforated tin, wire gauze, or other analagous contrivance by which means the lamp may be filled without removing the cap, and the spirit within the lamp may be protected from igniting when the lamp is filled, without the use of the double cylinder of wire gauze or perforated sheet metal as heretofore employed.

CULTIVATORS—Job Brown, of Lawn Ridge, Ill.: I claim the combination of the angular-shaped frame, a a', (having the two pieces, a and a', united at their forward ends into a tongue) with the long standards, d d', e e', and short standards, h h', in the manner and for the purposes set forth.

DEVICE FOR ADJUSTING MILL SAWS—Thomas M. Chapman, of Oldtown, Me.: I claim the stocks, D D, secured to the upper and lower cross pieces of the grate or sash, A, the stocks having a bolt or stop, f, at each end, arranged in the manner and for the purpose as shown and described.

MULTIGRADS IRON FENCE—Matthias P. Coons, of Brooklyn, N. Y.: I claim the combination of the devices as represented by figure 6, the form of mortice in picket, C, as represented by P, and the collar, M, and sleeve, E, in combination in the manner and for the purpose substantially as set forth and described.

MODE OF ADJUSTING VESSELS UPON THE KEEL BLOCKS OF DRY, SECTIONAL, OR RAILWAY DOCKS—Horace J. Crandall, of East Boston, Mass.: I claim the manner in which the materials are arranged for the purpose of holding vessels by the keel in a required place in dry, sectional, or railway docks.

LOOMS FOR WEAVING FIGURED FABRICS—Geo. Cromton, of Worcester, Mass.: I claim arranging two or more patterns upon a single chain, so that by bringing the rods of the chain into operation in a certain order, one pattern is produced, and by operating them in a different order another pattern is produced in the manner described.

2nd. I claim placing two or more patterns upon the rod of a pattern chain, side by side, and operating them in succession, by vibrating the chain laterally in the manner described.

3rd. I claim pivoting the lifting and depressing rods, G P, at one end, the other end being made adjustable in the manner, and for the purpose set forth.

SEWING MACHINES—Daniel Harris, (assignor to John P. Bowker,) of Boston, Mass.: I am aware an arm for slacking and raising up the slack of the needle thread has been used, and this I do not claim.

But I claim so arranging the bent arm, d, that by its movement it shall perform the triple operation of slacking up the thread, as the needle is about penetrating the cloth, and admit of the necessary pause whilst the shuttle passes through the loop, and then tighten up the stitch in advance of the upward motion of the needle bar, and draw from the spool the requisite amount of thread for the next stitch, as set forth.

PLOWS—Jonathan Hibbs, of Tullytown, Pa.: I am aware that a vibratory or rocking shaft, armed with teeth, and caused to act by the direct agency of the plowman, has been heretofore employed to produce similar results, but the action of this is necessarily intermitted and uncertain, and it is therefore entirely unlike my invention, which acts constantly and independent of the hand of the attendant.

I claim combining with the plow the revolving weed clearing rollers, armed with teeth or spikes, said rollers being operated automatically by a wheel attached to the back part of the plow, in the manner and for the purposes substantially as described.

PAGING MACHINE—Geo. Hodgkinson, of Cincinnati, Ohio: I am aware that a continuous band of tape has been for some time used in Europe in apparatus for numbering railroad tickets, and that more recently the application of a chain type bearer for the purpose of paging books has been made the subject of letters patent of the United States, I therefore disclaim the invention of a belt or chain in this connection.

But I claim, 1st, the construction and combination substantially as described, of the pair of taking up wheels, weighted double acting tension cord, and type bearer, f w x, in combination with the square shaft, l, and trigger, u, and actuating piston, O, or equivalent device, for the proper tension and delivery of the type bearer, f w x, during the alternate advancement and impression of the type.

2nd, The series of type blocks constructed and arranged as described, and consisting each in succession, of the consecutive odd number, coupled with the even number, three units higher in the scale, in combination with an extended platen, e, and its accessories, 6 z y, or equivalent devices, substantially as described, so as to act at each stroke upon the further pages of two consecutive leaves of an unfolded or open book.

3rd. The mode herein described and represented of clamping the type blocks to the band by means of a sheet metal sheath, x, inclosing the rear, side, and edges of the type holders.

METHOD OF ENGAGING AND DISENGAGING SELF-ACTING CAR BRAKES—Geo. T. Leach, of Boston, Mass.: I do not claim operating the brake by means of the back movement of a bunter slide, but I claim the combination of the two jointed pawl levers, M N, the socket shaft, L, and its lever workers, e f, and the two racks, a b, as arranged and applied to the bunter bar, I or K, and the brakes, and made to operate substantially as specified.

BREECH LOADING FIRE ARMS—Francis Maton, New York City; I am aware that breech pieces have been made with conical ends for fitting into gun barrels, and that a horizontal cross bar has been used in various mathematical instruments, these I do not claim.

But I claim the combination of a sliding breech piece having a semi-spherical socket and a partially rotating motion whilst closing on the end of the barrel with a fixed barrel having a corresponding semi-spherical end, the two forming a cap and ball joint, whereby the powder is brought nearer to the point at which the cap is exploded, a more certain ignition attained, and the joint between the breech and barrel more effectually closed, substantially as described.

I also claim the employment for the front sight of a fire arm of a needle wire or its equivalent having a bulge or enlargement at or near its middle, which is in a horizontal position when the arm is levelled for firing, as described.

OMNIBUS REGISTERS—Wm. Morris, of Philadelphia, Pa.: I do not claim the exclusive use of a spring notched pawl, engaging with the driving wheel.

But I claim forming a notch, f, near the end of the bell hammer bar, c, annexed to the toothed wheel, K, so as to cause the same to act as a double pawl or stop, on the teeth of said wheel, and prevent a recoil of the same, when the spring bolt, D, and cog, I, have not been drawn sufficiently high to strike the bell and record a fare, and the consequent striking of the bell by the pawl end of the bar, c, being allowed to move quickly upward upon said recoil, substantially as set forth.

RAILROAD CAR COUPLING—Joseph Miller, of Olean, N. Y.: I do not claim the hooks, as they have been used before.

But I claim the combination of the horizontally acting hook, C, with the vertically moving box, B, constructed and operated as set forth, for the purposes specified.

GRAIN WINNOWERS—William Moore, of Belleville, Ohio: I claim the arrangement of riddles around a perpendicular fan, so that grain can pass over each and be acted upon at any desired point by wind from said fan, as described and represented.

TAPE WORM TRAP—Alpheus Myers, M. D., of Logansport, Ind.: I claim a trap for the removal of tape worms from the stomach and intestines, constructed and operating substantially as described.

TAPE WORM OPERATION—Alpheus Myers, M. D., of Logansport, Ind.: I claim the process herein described of removing tape or other worms from the stomach or intestines by means of a trap, which is baited and swallowed by the patient, and is caused to capture them by the seizure of the bait.

CONTROLLING AND GUIDING LOGS IN SAW MILLS WITHOUT A CARRIAGE.—C. B. Normand, of Havre, France.—Patented in England Oct. 27th, 1852; in France, Nov. 5th, 1852: I claim as a method of controlling and guiding logs in saw mills, the employment of a longitudinal bar above the log, the lower edge of which bar is made sharp or angular to indent the prominent part or parts of the log, substantially as specified, and the said bar being parallel with the line of the intended cut, and movable vertically to suit logs of various sizes, all substantially as and for the purpose specified.

And I also claim in combination with the bar for controlling and guiding the upper edge of the log, substantially as specified, the employment of a like bar on which the log rests and moves, substantially as and for the purpose specified.

METHOD OF HANGING SAWS FOR MILLS—C. B. Normand, of Havre, France: I claim connecting the saw gate in which the saws are strained, with the outer ends of two vibrating beams, one at each end, substantially as described; but this I claim only when the two beams diverge from each other from their axes of vibration to their connection with the saw gate, substantially as described, and giving a motion to the saw or saws, substantially on the principle specified.

And I also claim placing and running the saw gate horizontally with the plane of the gate vertical or nearly so, substantially as specified, in combination with the placing of the carriage with its transverse plane parallel with and below the saw or saws, and passing through the saw gate, substantially as and for the purpose specified.

And I also claim composing the ways for the carriage of a series of cylindrical rollers, which can be shifted to variable hights, so that the upper part of their peripheries can be set to coincide with a flat plane or arcs of circles of large radius, substantially as described. in combination with the flexible carriage which can be bent to the shape of the intended cut, as determined by the set of the rollers composing the ways, substantially as described.

METHOD OF CONTROLLING THE LOG FOR CURVED AND BEVEL SAWING—C. B. Normand, of Havre, France. Patented in England Oct. 27th, 1852; in France Nov. 5th, 1852: I claim the mode of operation, substantially as specified, for directing the log or timber to the saw or saws in curvilinear sawing, by means of rollers or their equivalents whose axes can be shifted at pleasure, as specified, to determine and vary the line of motion of the log or timber to the saw or saws, without the necessity of turning or moving the saw or saws laterally, substantially as described.

I also claim mounting the rollers which support the log or timber to be sawed, in a swing or vibrating frame, or the equivalent therefor, substantially as specified, so that the plane tangent to the upper edges of the rollers can be placed at any desired angle with the plane of motion of the saw and there retained or gradually shifted in either direction during the sawing operation, whereby the log or timber can be sawed to any fixed and determined bevel, or to any bevel varying in any desired degree, as set forth.

INDIA RUBBER OVERSHOES—J. A. Pease, of New York City: I claim making india rubber or gum shoes with the inner surfaces ribbed, corrugated, or otherwise made uneven, for the purpose of allowing a circulation of air between it and the boot or shoe over which it is worn, and I claim this whether it be effected in the precise manner stated or by lining the shoe with a similar ribbed, corrugated, or otherwise raised and depressed surfaced fabric, as described.

EXCAVATOR AND DITCHING PLOW—C. A. Robbins, of Iowa City, Iowa: I do not claim a series of endless aprons for conveying the earth into carts or wagons, irrespective of forming one or more of them adjustable, for they have been previously used.

But I claim the employment or use of the vertical reciprocating cutter, C, arranged substantially as shown, for the purpose of cutting the earth into sods or pieces for the purpose of rendering the earth easy of removal, either by hand or by endless aprons.

EXCAVATING MACHINE—G. D. Stillson, of Rochester, N. Y.: I claim the controlling of the cutting edge of the excavator, so as to keep it always at or about the same relative position in regard to the earth to be removed, and yet admit of being raised or lowered to ease said cutting edge when too powerfully resisted, and thus materially aid the scraper in entering and passing through the earth to be removed by means substantially such as described.

I also claim the so hanging of the scraper to the frame which supports it, by means of pivoted radial arms or braces, as that said scraper and the earth thereon may, by the turning of a hand wheel or other equivalent device, be first raised up horizontally, or nearly so, a sufficient distance to admit of its being drawn away, and then by continuing to turn said hand wheel or other raising power, to gradually tilt and dump the scraper, substantially as described.

I also claim the hanging of the scraper to the frame or truck, by means of rigid arms, so as to employ the entire weight of the carriage and load upon it, in holding the scraper to its work.

I also claim the use of a breaker, substantially such as described, placed at or near the front of the scraper, for the purpose of loosening up the earth and facilitating its progress to the rear of the scraper, and to prevent packing or clogging in the front of the scraper, as set forth.

SHINGLE MACHINE—William Stoddard, of Lowell, Mass.: I claim, first, the riving knife, F, in combination with the sliding cap, E, when they are arranged and operated substantially as described, for the purpose set forth.

Second, I claim the spring stop, g, when made and operated substantially and for the purpose set forth.

Third, I claim the jaws, K, or their mechanical equivalents, when constructed and operated substantially as described, for the purposes set forth.

GRAIN AND GRASS HARVESTERS—Jacob Swartz, of Buffalo, N. Y.: I claim, first, the application to the driving or vibrating of the cutter bar of the crank, E, pitman, m, toggle levers, j j, hinged lever, P, and rod, N, for the purpose of giving four reciprocating motions to the cutter bar, for every revolution of the crank shaft, substantially as described.

I also claim so hinging the cutter and guard tooth bar to the machine, by means of the hinged pieces, O' and Q, as that it may rise and fall in parallel lines, whether used for cutting grain or grass, substantially as described.

MACHINERY FOR STRETCHING AND DRYING CLOTH—B. J. Tayman, of Philadelphia, Pa.: I claim, first, the means shown for stretching the cloth while wet and carrying the same parallel while being dried, consisting of the endless belts of tenter hooks traveling on adjustable guides or ways, to accommodate different widths of cloth, which ways are parallel to each other, except at the ends where they converge to allow the cloth to be hooked on, and stretched the same, as it is moved forward, substantially as specified.

Second, I claim the application of sponge rollers and fan brushes in combination with the drying cylinder to hasten the process of drying the cloth as specined.

SAW GAUGE—Orson Westgate, of Riceville, Pa.: I claim the construction of the bed piece, A, with the cog racks, F F F F, in connection with the cog wheels, D D, and the brakes, J J, pressed upon the said cog wheels, D D, by means of the spring, K R, constructed in the manner described, or any other construction substantially the same.

CONSTRUCTING PRINTING BLOCKS—Leon Jarosson, of Jersey City, N. J.; I am aware that letters and other characters have been cut out of sheets of felt or other substance, and then secured to the surface of a block, and I do not therefore claim, broadly, the cutting a character out of a sheet or plate of the thickness of the intended relief.

But what I do claim in the improvement of block printing, is cutting the several parts of the design or the design and ground, the one out of the other, from a plate or sheet of prepared felt, wood, or other suitable substance of the thickness of the required relief, and then securing the parts to the surface of blocks by means of cement, glue or other suitable means, substantially as specified, by means of which I am enabled greatly to reduce the cost of producing the printing blocks, for by the one act of cutting I produce two printing surfaces to print with different colors, and in that proportion whatever may be the number of colors of the intended design, and by which also I insure the exact fit of the several blocks for printing the several colors, as specified.

CASTING TYPE—George Bruce, of New York City; I do not claim the application of an artificial blast to the fire; but I claim the application of an artificial blast to cool the type mold, or prevent it from over-heating in casting, by which printing types can be cast much more rapidly than ever before, as described.

ROLLERS FOR PATTERN CHAINS FOR LOOMS.—George Crompton & M. A. Furbush, of Worcester, Mass.: We do not claim the process of uniting cast and wrought iron by casting the one upon the other; neither do we claim any metalurgic process whatever.

But we claim the described improvements in pattern chain rollers, a wrought iron tube being made use of for the bearing of the roller, the body of the roller being secured thereto by casting, in the manner set forth, whereby the rollers, when strung upon the chains, are caused to fall into the exact positions required to operate the hooked jacks, without the necessity of gauging and turning down the roller, as has heretofore been done.

ARRANGEMENT OF LEVEL AND CATCH FOR TOW-LINES OF CANAL BOATS—J. W. Cadwell, of Rochester, N. Y.: I am aware that bodies at rest and in motion have been both united and disengaged by means of a tumbler and lever, consequently I do not claim the use of a tumbler and lever alone, whether separately or combined.

But what I claim is my arrangement of the frame, A, the tumbler, B, the lever, C, with the ring, n, and spring, s. the whole operating for the purpose and in the manner substantially as described.

RE-ISSUE.

WINNOWING MACHINES.—Samuel Canby, or Ellicott's Mills, Md. Patented originally Dec. 28, 1852: I claim the automatic graduation of the fan blast by means of a piston, R, in a passage communicating with the furnace, balanced by weight to support the atmospheric pressure due to the rarefaction produced by a given velocity of the fan, but movable when said velocity varies, and by connection substantially as set forth, with valves regulating air passages, h h', so operating them as to diminish the capacity of said passages when the velocity of the fan is too great, and producing the contrary effect if the blast be weakened by a diminished velocity of the fan, as specified.

ADDITIONAL IMPROVEMENT.

CONSTRUCTION OF REED MUSICAL INSTRUMENTS—F. A. Gleason, of Rome, N. Y. Patented June 20, 1854: I claim the application of hammers to reeds operated as described, or by any similar method producing the same result.

[Eight of the applications in the above list were prepared at the SCIENTIFIC AMERICAN Patent Agency.

Reports of Patent Cases.

"A Collection of Patent Cases decided in the Supreme and Circuit Courts of the United States, from their organization to the year 1850, with Notes and a copius Index to the subject matter. By James B. Robb, counsellor-at-law. Two volumes. Boston: Little, Brown & Co. 1854.

These two volumes unquestionably present the most complete exposition of the patent law of the United States that is now in print. They contain all the reported decisions of the Circuit and Supreme Courts of the United States prior to 1850. The cases, numbering just 124, and selected from some sixty volumes of reports, are arranged very nearly in chronological order, and embrace all the decisions illustrating the principles of the patent law which had been made in this country up to 1850.

All the statutes relating to patents are appended to the work, and wherever the decisions upon earlier ones have been modified by subsequent legislation, the fact is carefully noted by the editor. This service will, we doubt not, be duly appreciated by the profession.

The editor promises to give the decisions which have been made since 1850 in a third volume if the reception of these is such as to warrant it. We cannot doubt that it will be, for nowhere else, as we have already intimated, can the patent law of the United States be found in so compact, conveniently arranged, complete, and accessible a shape. We may add with propriety that these books are printed as law books are printed nowhere else in the United States out of Boston.

There is one particular in which we could have pardoned Mr. Robb for departing from the exact letter of the original reports; that is in giving the first names of counsel, which is rarely done by the reporters of the United States Courts. It is not of so much consequence perhaps now, but the time will come when people may be puzzled to know when they read Emmet for plaintiff, Webster for defendant, Ingersoll for appellant, Binney for respondent, which Emmet or Webster, and which Ingersoll or Binney is referred to."

The above we copy from the *Evening Post*, and we doubt not there are hundreds of readers of the SCIENTIFIC AMERICAN who will be glad to procure this valuable collection of patent cases. Will Messrs. Little, Brown & Co., please forward the volumes to us, that we may give them a careful examination. A majority of our readers are directly interested in these decisions.

A Tribute of Respect.

We learn by the Nashville *American* that the last General Assembly of Tennessee appointed a committee of three members, consisting of John H. Smith, W. H. Clemens, and E. S. Cheatham, to present a gold medal to Mark R. Cockrill, Esq., as a testimonial of esteem for his devotion through a long life devoted to the advancement and developement of the agricultural resources of that State, especially in wool growing. This medal was presented on the 19th of last month. It is the first distinction of the kind ever conferred upon one of its citizens, and we hope it will not be the last. States and governments have always exhibited wonderful alacrity in rewarding with swords and the like, those who have distinguished themselves on the battle-field, but they have often overlooked the claims of the patriots of industry like Mr. Cockrill, who has for forty years devoted himself with wonderful assiduity to improvements in the growth of wool. In his answer to the gentleman who presented him with the medal, he says, "At the World's Fair at London, in 1851, the premium for the golden fleece was awarded to Tennessee. Germany, Spain, Saxony, and Silicia were there; the competition was strong, honorable, and fair. Nature gave me the advantage in climate, but the noble lords and wealthy princes of Europe did not know it, neither did my own countrymen know it until we met in the Crystal Palace of London before a million of spectators.

Whilst their flocks were housed six months in the year, to shelter them from the snow of a high latitude and were fed from the granaries and stock yards, mine were roaming over the green pastures of Tennessee, warmed by the genial influence of a southern sun—the fleece thus softened and rendered oily by the warmth and green food, producing a fine even fiber."

This testimony to the superior character of American wool, affords us the most indisputable basis for predicting that the United States will yet become as famous for its wool as it is now for its cotton.

Another Medical Prize Question.

The New York Academy of Medicine, through the liberality of a few of its members, offers a prize of $100 for the best essay on "The Nature and Treatment of Cholera Infantum," to be presented during the ensuing year. The trial for the prize is open to the professions throughout the country.

A Just Law.

The Legislature of Vermont, now in session, has passed a law to punish fraudulent issue and transfer of stock, making such issue a felony, punishable by a fine not exceeding $1,000, and imprisonment in the State Prison for a term not less than one year nor more than ten.

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TO CORRESPONDENTS.

W. and M., of N. Y.—It has been decided in one case that the old Woodworth machines could be used by those who were in possession of them before the extension, but we could not give you the particulars of that case at present.

B. H. W., of Mo.—We presume you have received the letters patent before this. They were issued last week.

Robert Scott, edge tool and shovel manufacturer, Montreal, Canada, wishes to procure six or eight machines for making wood screws. He thinks it will be advantageous for some maker to correspond with him upon the subject.

A. H. G., of C. W.—Your idea in regard to an endless chain water wheel is not new. Such wheels are among the earliest known.

K. C., of Mass.—Your improvement in looms is a good one, and we think it is new. Send us a model of it.

J. B., of Texas—Send us a sketch of your improvement in carriages and we will examine it. The mere idea you suggest in regard to turning short corners is not new, but the contrivance for doing it may be.

C. G. M., of Md.—The sketch of your press shows a new device, and we think it can be secured by patent.

C. S., of Ky.—If you purchase Smees' *Metallurgy*, which no doubt you can in Louisville, it will give you all the necessary directions respecting the electrotype.

C. H. B., of Tenn.—The samples of mineral which you have sent are not such as you suppose; they are mica schist. The mineral to which you referred burns like a candle when placed in a fire.

——of New Castle, C. W.—your letter describing an "appendage for a steam engine," lacks the name of the writer, therefore we cannot reply to it by letter. Send us a sketch and description, together with your name, and we will give it a careful examination.

L. M. T., of Md.—We cannot give you the full address of Dr. Ayers. We presume a letter addressed to Dr. A. at San Francisco would reach him.

S. R. H., of Ohio—The cant hook lever shown in your sketch, does not embrace any patentable feature. We would not advise you to apply for a patent.

H. R., of Ohio—Your ideas in regard to the preservation of daguerreotypes, and keeping a register of the age of deceased persons in tomb stones, are not new. Patents already exist for similar devices.

W. E. S., of N. Y.—Your method of straining saws presents no patentable feature that we can discover. It seems to be a well understood arrangement.

C. C., of N. Y.—It is now too late to present applications for space in the French Palace of Industry.

A. H. D., of Mich.—There is nothing new in your proposed mode of employing the force of steam. A conical or expanding mouth has been proposed for application to the discharge orifices of an engine, on the principle of the Barker Mill, for the same purpose, viz; employing the expansive force of steam. We doubt whether any perceptible effort would be produced by this means, as the wide open mouth allows the steam to expand so readily lengthwise of the tube, that the pressure on the sides would be merely nominal, and besides, would act at an angle of 90—22½ equal 67½ to the direction in which the force is to act, which would be something like pushing a very obtuse wedge.

W. M. B., of Ind.—The best and cheapest cement as a substitute for stones for the feet of your fence posts, would be of hot pitch, clean sand, some oil, and brick dust, but after all, it appears to us that stones would be cheaper still. You need not be particular about the proportions of this cement; use pitch enough to make it plastic, so as to mold it into square blocks. Blocks made of lime and sand, then well dried and covered with boiled oil, will stand the weather for a long time.

J. S., of Ky.—We have perused your long letter with considerable interest, but owing to the great amount of matter we have published on water wheels, we could not judiciously publish it at present. We presented your letter and sketch referred to, and expressed our opinion fairly. We agree with you that any theory contrary to facts ought to be repudiated. We must say, however, that when J. B. C. publishes his work on the subject, we hope to have those facts clearly presented so that there will be no room to say a word in the negative. You deserve great credit for what you have done respecting water wheels.

F., of Boston—Yours will receive attention next week.

W. C. D., of Fla.—We have not been able to give your letter attention yet.

L., of Texas—We do not know of any substantial mode of plastering outside walls on laths. If you use common mortar well mixed with hair for the inside coat, and use good common plaster of lime and sand for the outside coat, and then, when dry, wash it with a solution of alum, it will answer a good purpose; but outside plaster walls on lath are easily affected by the weather.

H. K., of Mass.—Yours has been received. All our ferry boats have steam whistles—you are certainly in error respecting the distance they can be heard. The *Arctic* was well caulked, and as stout a ship as sailed the ocean; Mr. Cunard admits this. Nautical men will not dispute with you for whom the life boats are designed—both passengers and crew. The *Arctic* had good pumps.

E. S. R., of La.—H. C. Sargeant, of Cincinnati, has a patent for an improved device for feeding water to boilers without the use of a pump. It is quite simple, and may be what you want. We do not know whether it has been tried or not. Several devices have been gotten up for this purpose, but have not given much satisfaction we believe. We thank you for your efforts to circulate the SCIENTIFIC AMERICAN.

A. R. H., of Pa.—Many persons have speculated upon devices to prevent collisions, but as yet without practical or beneficial results.

Money received on account of Patent Office business for he week ending Saturday, Nov. 18:—

A. R. H., of Pa., $55; G. H., of Miss., $30; G. C., of Ind., $25; F. Z. T., of N. Y., $25; M. D. Du B., of N. Y., $20; C. W., of Tenn., $30; H. B. & S. E. C., of N. Y., $30; G. F. W., of N. Y., $30; P. D., of N. Y., $25; W. & S., of O., $30; W. S. B., of Pa., $30; T. W., of Ind., $30; J. C. G., of Mass., $30; H. S. F., of Pa., $26; J. C. H., of Wis., $150; B. F. McC., of Ga., $30; M. W., of Pa., $15; B. & C., of Mass., $650; P. C., of Pa., $25; G. P. K., of Ind., $25; W. H. Van G., of Ct., $60; R. B. G., of N. Y., $35; H. & C., of N. Y., $25; O. B. J., of N. Y., $25; H. & B., of N. Y., $55; J. W., of N. Y., $25; W. H., of Mass., $30.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Nov. 18:—

J. B., of Mass.; S. T. S., of Mass.; G. C., of Ind.; P. D., of N. Y.; H. & C., of N. Y.; O. B. J., of N. Y.; P. C., of Pa.; H. & B., of N. Y.; J. W., of N. Y.; G. P. K., of Ind.; W. H. Van G., of Ct.; R. B. G., of N. Y.; W. H., of Mass.

☞We are able to furnish all the back numbers of the present volume of the SCIENTIFIC AMERICAN, and to new subscribers we shall continue to send the back numbers as long as we have them, so as to render their volumes complete.

FOREIGN SUBSCRIBERS—Our Canada and Nova Scotia patrons are solicited to compete with our citizens for the valuable prizes offered on the present volume. [It is important that all who reside out of the States should remember to send 25 cents additional to the published rates for each yearly subscriber—that amount we are obliged to pre-pay on postage.]

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American and Foreign Patent Agency.

IMPORTANT TO INVENTORS.—MESSRS. MUNN & CO., Publishers and Proprietors of the SCIENTIFIC AMERICAN, continue to prepare specifications and drawings, and attend to procuring patents for new inventions in the United States, Great Britain, France, Belgium, Holland, Austria, Spain, etc., etc. We have constantly employed under our personal supervision a competent board of Scientific Examiners, which enables us to despatch with great facility a very large amount of business. Inventors are reminded that all matter intrusted to our care are strictly confidential, and hence it is unnecessary for them to incur the expense of attending in person. They should first send us a sketch and description of the invention, and we will carefully examine it, state our opinion, and the expense of making an application, if deemed new and worthy of it. Models and fees can be sent with safety from any part of the country by express. In this respect New York is more accessible than any other city in our country. Circulars of information will be sent free of postage to any one wishing to learn the preliminary steps toward making an application.

Having Agents located in the chief cities of Europe, our facilities for obtaining Foreign Patents are unequalled. This branch of our business receives the especial attention of one of the members of the firm, who is prepared to advise with inventors and manufacturers at all times, relating to Foreign Patents.

It is very important that trustworthy and competent agents should be employed in securing patents, as great care is necessary in the preparation of the papers, as well as integrity in taking proper care of the case until the inventor is duly invested with his legal rights. Parties intrusting their business in our hands can rely upon prompt and faithful attention. Most of the patents obtained by Americans in foreign countries are secured through us; while it is well known that the largest proportion of patents applied for in the U. S., go through our agency.

The offices of Messrs. Munn & Co.'s American and Foreign Patent Agency are at 128 Fulton Street, New York; London, No. 16 Castle st.; Paris, No. 29 Boulevard St. Martin; Brussels, No. 6 Rue D'Or.

UNITED STATES PATENT OFFICE,
Washington, August 4, 1854.

ON THE PETITION of David Matthew, of Philadelphia, Pennsylvania, praying for the extension of a patent granted to him the 31st day of December, 1840, for an improvement in "Spark Arresters," for seven years from the expiration of said patent, which takes place on the 31st day of December, 1854;

It is ordered that the said petition be heard at the Patent Office on Monday, the 18th of December next, at 12 o'clock M., and all persons are notified to appear and show cause, if any they have, why said petition ought not to be granted.

Persons opposing the extension are required to file in the Patent Office their objections, specially set forth in writing, at least twenty days from the day of hearing. All testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the Office, which will be furnished on application.

The testimony in the case will be closed on the 8th of December; depositions and other papers relied upon as testimony must be filed in the office on or before the morning of that day; the arguments, if any, within ten days thereafter.

Ordered, also, that this notice be published in the Union, Intelligencer, and Evening Star, Washington, D. C.; Pennsylvanian, Philadelphia. Penn.; Scientific American, N. Y.; Post, Boston, Mass., once a week for three successive weeks previous to the 18th of December next, the day of hearing. CHARLES MASON,
Commissioner of Patents.

P. S. Editors of the above papers will please copy and send their bills to the Patent Office, with a paper containing this notice. 11 3

READING'S PATENT HORSE POWER CORN Sheller and Cleaner. Patented July 13th, 1852. This machine took the first premium in 1853 at the World's Fair, American Institute, New York; Franklin Institute, Philadelphia, and six other county and State Fairs, and its superiority is fully established: it will shell and clean perfectly from 75 to 150 bushels per hour, the right to make and sell the machines can be had by responsible manufacturers at $6 each, and agents who effect sales of Territory shall be entitled to 50 per cent. of the gross receipts, as the owner is unable to attend to the business, here is an inducement for persons to engage. as the utility of the machine is known. Apply to WM. READING, Washington, D. C. 11 4*

TO SAW MAKERS—For sale a machine for grinding circular saws on both sides simultaneously, and will grind them one uniform thickness, concave or convex, if wanted, patented May 4 1852, the machine can be seen in working order, also a working model for mill saws and cross-cuts by applying to the patentee, WM. SOUTHWELL, No. 42 Master street, Philadelphia. Pa. Patent rights for sale on the above. 11 2*

MACHINE GROUND CIRCULAR SAWS—(Patent applied for.) Mill men would do well to try these saws, are perfectly free from thin or thick places, can be used thinner and with less sett, and run faster than any other hitherto made. All diameters and thicknesses warranted perfectly true. HENSHAW & CLEMSON, 31 Exchange street, Boston. 11 8

IMPORTANT TO INVENTORS, &c., &c.—ALFRED ASTON, No. 4 High street, Birmingham, England, is open to purchase for cash all kinds of mechanical and useful inventions or manufactured articles that will command a ready sale in England. Established in the year 1770 for the sale of all articles in the hardware and general trade. Address paid letters as above. 11 4

DICTIONARY OF TECHNICAL TERMS—In French, English, and German. A new work presenting all the terms used in science and art. The terms are first given in French, then in English and German. It is the first of three volumes arranged differently, and is a very useful work. For sale at this office, price $1,31

TO SPECULATORS IN PATENT RIGHTS—The subscriber has several improvements, (some in machinery, and some of them in household articles) which will be sold on terms to admit of profitable speculations. Apply corner Myrtle and Classon Aves., East Brooklyn. GERARD SICKLES, Agent 11 4*

IRON PLANERS—NEW PATTERN—Now building, and for sale on better terms than any others in the country of same quality. Address New Haven Manufacturing Co., New Haven, Conn. 11 tf

IRON MOLDERS' FACINGS—Viz., Sea Coal, Anthracite and Charcoal, Soapstone and Black Lead, for sale by G. O. ROBERTSON, 135 Water street, corner of Pine. 11 4*

THE FRENCH EXHIBITION—Parties who have applied for space in the French Palace of Industry, and who do not intend to be present at the Exhibition, are recommended by the undersigned to arrange with Messrs. Gardissal & Co., No. 29 Boulevard St. Martin, Paris, who are prepared to put upon Exhibition, attend, and effect sales of articles intrusted to their care. It is a responsible concern. S. H. WALES, State Commissioner, Scientific American Office.

PIG IRON—SCOTCH AND AMERICAN—Also Cupola Fire Bricks, Clay and Sand, for sale by G. O. ROBERTSON, 135 Water street, corner of Pine. 11 4*

IRVING'S PAT NT SAFETY CIRCULATING STEAM BOILER—This is the most safe. economical, compact, and convenient boiler devised, occupying less than half the space, consuming only half the fuel, generating more steam of a better quality, and requiring less labor in management and use than any other known. The rapid and powerful circulation which it secures, prevents incrustation or scale, and preserves the internal surfaces fresh and clean. On this account it is believed to be better adapted to salt or turbid waters than any boiler extant. Its compactness, its strength, its economy of space and fuel, and its rapid generation of steam, peculiarly adapt it to the navigation of our western rivers, as well as to all stationary, portable and marine purposes. The attention of all consumers of steam, of mechanics and engineers, is invited to a critical examination of its merits. Boilers of all sizes furnished on short notice. Rights negotiated and circulars obtained on application at the office of the Company. W. F. PHELPS, Sec.'y Irving Boiler Company, 347 Broadway. 10 6eow*

IMPORTANT TO MANUFACTURERS OF R. R. Cars, Doors, Sash Blinds, and other wood work.—We are now fitting up largely for the manufacture of Wardwell's Patent Tenoning Machine, for which a patent was granted the 29th of August last. They will do the work of from 3 to 8 ordinary machines. They complete at one operation, even to chamfering tenons of any length, width, thickness, or style. They cut double tenons, which no other machine can do. They are substantially made, and by far more durable than any other in use. They have been in successful operation for the past 10 months. COLE, DAVIS, & CO., Lake Village N. H. For rights, address C. P. S. WARDWELL, at Lake Village. 9 3

SPECTACLES—Spy Glasses, Microscopes, Platina Points, &c. &c., &c., McALLISTER & BROTHER, 48 Chestnut street, Philadelphia. 9 4

DRAUGHT BOARDS—Patent, 23 by 29 inches.—Ready sales their best recommendation. Cheapest instruments in use. Complete for $10. Sent by Express. Direct (post paid) to CHAMBERLIN & Co., Pittsfield, Mass. 85t*

THE EXCLUSIVE RIGHT TO MAKE AND sell Gale's Eagle Feed Cutters. See engraving in No. 8, Vol. 10 Scientific American, For cutting all kinds of fodder, particularly cornstalks, by hand power, is offered for sale for the Western States, and fifteen counties in Western New York. Nourse & Co., of Boston, Mass., manufacture and sell for the balance of the United States. Retail price in Boston for best size $16. Parties wishing to buy rights can get the refusal of the territory wanted, long enough to send to Nourse & Co. to get a machine, and cut, if they choose, a hundred tuns of feed with it: by that time it is fair to presume they can form an intelligent opinion as to its value. The patent is a good one, and cannot be dodged by pirates.—Letters in reference to rights should be sent direct to WARREN GALE, No. 4 North Market st., Boston, Mass. 8 4

AMERICAN STONE DRESSING MACHINE—"Porter's Patent," illustrated in No. 8, present Volume. The subscribers are now prepared to sell rights to use the above machine, patented August 8th. 1854. One is now on exhibition at Nos. 35 and 37 Ganesvoort street, in the city of New York, and all persons interested in the business are invited to visit it, as the machine itself will give the best idea of its own capacity. Being very simple in its construction, and adapted to a great variety of purposes, requiring but little power, saving an immense amount of labor, and producing surfaces far more perfect than can be produced by hand, it is believed that no one carrying on the business of working stone, of whatever nature, can long afford to be without one. CAPWELL & PORTER,
8 6* New York City.

TO MACHINISTS, RAILROAD COMPANIES, and others—SHRIVER & BROTHERS, Cumberland, Md., have now on hand, for sale, Engine Lathes, 8 feet bed, swing 19 inches; ditto, 10 feet bed, swing 24 inches; Hand Lathes, 8 feet bed, swing 18 inches; Planing Machines, plane 6 feet long and 32 inches wide. We are also manufacturing a variety of other sizes and descriptions of machinists' tools, all of which are built in the best style, and warranted to give perfect satisfaction.—First premiums have been awarded us by the Maryland Institute, Baltimore; and the Ohio Mechanic's Institute, Cincinnati, O., at their Exhibitions this year. 8 4

PHILOSOPHICAL APPARATUS—Of every description. McALLISTER & BROTHER, 48 Chestnut street, Philadelphia. 9 4

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YOU CAN GET THE NEW YORK WEEKLY SUN three months for 25 cts.; six months 50 cts.; one year, 75 cents, 16 months, $1. Or three copies one year, $2; eight copies $5; twenty-five copies $15; and by canvassing for subscribers you may get one of the five cash prizes $50, $20, $15, $10, and $5—for the largest lists sent in before 3rd Feb.—Specimen copies gratis.—Send letters and money (post-paid) to MOSESS. BEACH, Sun Office, New York. 6

COTTON AND WOOLEN MANUFACTURERS' Supplies of every description; also machinery of all kinds; wrought-iron Tackle Blocks of all sizes; Leather Belting superior oak tanned; Bolts, Nuts, and Washers of all sizes on the most reasonable terms. 6 13* SAML. B. LEACH, 51 Broad st.

PORTABLE STEAM ENGINES.—S. C. HILLS, No. 12 Platt st., N. Y., offers for sale these Engines, with Boilers, Pumps, Heaters, etc., all complete, and very compact, from 2 to 10 horse power, suitable for printers, carpenters, farmers, planters, &c. A 2½ horse can be seen in store, it occupies a space 5 by 3 feet, weighs 1500 lbs. price $240; other sizes in proportion. 8 e8w

MACHINIST'S TOOLS—Now finished, two Engine Lathes, 9½ feet bed, 18 inches swing; one do. with screw cutting apparatus; also, one 7½ feet bed, 18 inch swing; and two do. with screw, from new and improved patterns and of superior workmanship, by C. S. TOLMAN & CO., Fitchburg, Mass. 3 6eow*

WANTED—To take charge of the sale or introduction of certain valuable Patented Mechanical Inventions, a person who can furnish satisfactory evidence of character and ability for such business. Address, stating views as to remuneration, &c., L. P. C., Post Office, New York. 9 3*

KENTUCKY LOCOMOTI WORKS—Corner of Kentucky and Tenth streets, Louisville, Ky.—The proprietors of the Kentucky Locomotive Works would respectfully inform Railroad Companies and the public generally, that, having completed their establishment, they are now prepared to receive and execute orders with fidelity and dispatch. They will contract for Locomotives, Passenger, Baggage, Freight, Gravel, and Hand Cars, of every style and pattern, as well as all kinds of Stock and Machinery required for railroads.—Particular attention will be paid to Repairing, for which they have every facility. They are also prepared to contract on favorable terms for building all kinds of Machine Tools, such as Turning Engines, Laths, Planers, Drills, Slotting, Spliming, and Shaping Machines of every variety of pattern. Having also a large Foundry connected with the establishment, orders for castings are solicited, and will be filled with promptness. Car Wheels of any pattern can be furnished on short notice. Double and single plate and Spoke Wheels of all sizes constantly on hand. Communications or orders must be addressed to OLMSTED, TENNEYS & PECK, Louisville, Ky. 40 6m*

OIL! OIL! OIL!—For railroads, steamers, and for machinery and burning—Pease's Improved Machinery and Burning Oil will save fifty per cent., and will not gum. This oil possesses qualities vitally essential for lubricating and burning, and found in no other oil. It is offered to the public upon the most reliable, thorough, and practical test. Our most skillful engineers and machinists pronounce it superior and cheaper than any other, and the only oil that is in all cases reliable and will not gum. The Scientific American, after several tests, pronounced it "superior to any other they have ever used for machinery." For sale only by the inventor and manufacturer.
F. S. PEASE, 61 Main st., Buffalo, N. Y.
N. B.—Reliable orders filled for any part of the United States and Europe. 6tf

BUFFALO MACHIN RY DEPOT—Terrace St. and 36 Lloyd st., Buffalo; J. W. HOOKER, Proprietor, H. C. Brown, Superintendant, offers for sale Machinists' tools of all kinds: Engine Lathes, Planers, Drills, Chucks, Boring Mills; also machinery of all kinds on hand or furnished to order. 7tf

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D.W. WHITING, Freight Agent, and also General Forwarder, having been a practical machinist, is prepared with skill and implements to handle and ship by any line, all kinds of machinery and manufacturers' wares. Mark plainly, care D. W. WHITING, Buffalo, N. Y. 7tf

STEAM ENGINES AND BOILERS FOR SALE.—One new eight-horse engine. One second hand five-horse engine. Tubular boilers, second-hand, suitable for same. One second-hand two horse portable engine and boiler. THOS. PROSSER & SON, 28 Platt street, 4tf

STAVE AND BARREL MACHINERY—Hutchinson's Patent. This machinery which received the highest award at the Crystal Palace, is now in daily operation there. Staves, heading, &c., prepared by it are worth to the cooper 20 to 40 per cent. more than when finished in any other way. Special attention is invited to the improved Stave Jointer. Apply to C. B. HUTCHINSON & CO., Crystal Palace, or Auburn, N. Y. 1 tf

PATENT DRIERS—Zinc Driers, Graining Colors, Stove Polish, Gold Size, &c., &c., 114 John street, New York. QUARTERMAN & SON, Manufacturers. 1 6m

NEW HAVEN MANUFACTURING COMPANY Machinists' Tools. Iron planers and Engine Lathes of all sizes. Hand Lathes, Gear Cutters, Drills, Bolt Cutters, Chucks, &c., on hand and being built by the quantity, which enables us to sell low. For cuts giving full description and prices, address New Haven Manufacturing Co., New Haven, Conn. 1 tf

A. B. ELY, Counsellor at Law, 52 Washington st., Boston, will give particular attention to Patent Cases. Refers to Messrs. Munn & Co., Scientific American. 16 1y*

VAIL'S CELEBRATED PORTABLE STEAM Engines and Saw Mills, Bogardus' Horsepowers, Smut Machines. Saw and Grist Mill Irons and Gearing, Saw Gummers, Ratchet Drills, &c. Orders for light and heavy forging and castings executed with dispatch. 8 1y* LOGAN VAIL & CO., 9 Gold st., N. Y.

HARRISON'S GRAIN MILLS—Latest Patent.—$1000 reward offered by the patentee for their equal. A supply constantly on hand. Liberal Commissions paid to agents. For further information address New Haven Manufacturing Co., New Haven, Conn., or to S. C. HILLS, our agent, 12 Platt Street, New York. 1 tf

ENGINEERING—The undersigned is prepared to furnish specifications, estimates, plans in general or detail of steamships, steamboats, propellers, high and low pressure engines, boilers and machinery of every description. Broker in steam vessels, machinery, boilers, &c. General Agent for Ashcroft's Steam and Vacuum Gauges, Allen & Noyes' Metallic Self-adjusting Conical Packing, Faber's Water Gauge, Sewell's Salinometers, Dudgeon's Hydraulic Lifting Press, Roebling's Patent Wire Rope for hoisting and steering purposes, etc.
CHARLES W. COPELAND,
1 tf Consulting Engineer, 64 Broadway.

THE MERIDEN MACHINE CO.—Successors to Oliver Snow & Co., West Meriden, Conn. Have on hand and make to order a great varlety of Lathes, Planers, and other machinists tools of superior quality and finish. Cuts of these tools may be had on application as above, with full particulars. They also manufacture Farnam's Patent Lift and Force Pumps of all sizes. For mines, factories, railroad stations, &c. Having a large and extensive variety of patterns, the accumulation of over 20 years business, and extensive facilities for making light or heavy castings, are prepared to contract for any kind of mill work, mining machinery, &c. New York Office and Sample Room, No. 15 Gold, cor. Platt st. 1 3m*

PHŒNIX IRON WORKS—GEO. S. LINCOLN & CO., Hartford, Conn. Manufacturers of Machinists Tools. Are constantly making and have now on hand an assortment of Screw Cutting Engine Lathes, viz.:—No. 1. bed 10 ft. long, swing 20 inch. No. 2. bed 14 ft. long, swing 30 inches, No. 3. bed 16 1-2 ft long, swing 40 inches, with improved bed, cast steel spindles, feed motion carried by a screw, toothed rack for moving tool rest by hand, improved gibb rest and tool stock, stationary and traveling back rest; also manufacturers of Lathes for turning Locomotive Driving Wheels, small Power Planers, Upright Drills, Power Punching Presses, &c. Designs of the tools with further descriptions, will be sent by addressing as above. 1 3m*

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Science and Art.

Valuable Discovery of Gum.

A few weeks ago we noticed the discovery of great fields of gypsum, and great supplies of gum arabic, at the head waters of Red Brazos, by the expedition of Captain Marcy. Since that period, the Washington *Star* has published some correspondence of Thos. L. Drew, Superintendent of Indian Affairs, and Dr. Shumard, physician to the expedition, describing the gum. Dr. Shumard says, in relation to it, "This gum, for which I propose the name of gum mezquite, is believed to occur in inexhaustible quantities, and will no doubt prove a valuable source of revenue to the State of Texas, New Mexico, and the adjacent Indian territory, besides affording employment to the different tribes of Indians now roving upon the plains, many of whom would no doubt be glad to gather and deliver it to the different frontier posts for a very small compensation.

The mezquite tree, from which this gum is obtained, is by far the most abundant tree of the Plains, covering thousands of miles of the surface, and always flourishes most luxuriantly in elevated and dry regions. The gum exudes spontaneously in a semi-fluid state from the bark of the trunk and branches, and soon hardens by exposure to the atmosphere, forming more or less rounded and variously colored masses, each weighing from a few grains to several ounces. These soon bleach, and whiten upon exposure to the light of the sun, finally becoming nearly colorless, semi-transparent, and often filled with minute fissures. Specimens collected from the trunks of the trees were generally found to be less pure and more highly colored than when obtained from the branches.

The gum may be collected during the months of July, August, and September;—but the most favorable period for that purpose is in the latter part of August, when it may be obtained in the greatest abundance, and with but very little trouble. The quantity yielded by each tree I found to vary from an ounce to three pounds; but incisions in the bark not only greatly facilitated its exudation, but causes the tree to yield a much greater amount. As it is, a good hand will probably be able to collect from ten to twenty pounds in a day. Were incisions resorted to, probably double the amount may be obtained."

Mr. Drew says respecting it, "The remarkable similarity of taste, appearance, and mucilaginous qualities of this gum to that of gum arabic, induced Dr. Shumard to make some experiments, the result of which proving satisfactory, he caused some twenty pounds to be gathered, which was brought home on his return some ten days past.

Upon diluting one ounce of this gum in two ounces of cold water, I had a fine glutinous paste, which I have used in sealing envelopes and other packages. I have also caused it to be mixed with starch in the application to linen, and in both instances have no hesitation in saying that it is equal to the article for which it must soon become a popular substitute. In its first form the Indian Department, you will perceive, is permitted the privilege of its first official use. It will be seen that its adhesive or glutinous qualities cannot be excelled, as I have sealed up the box with it and will use it on the outward envelope."

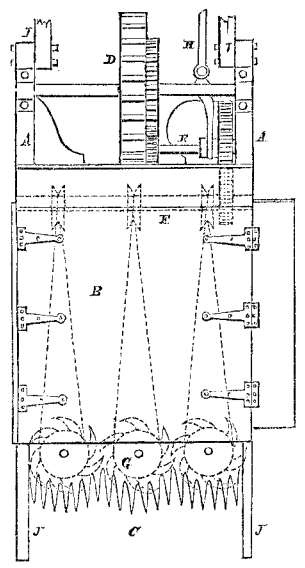
Our constant readers will remember that we have oftentimes urged travelers and exploring geologists to search for new natural products in our forests, asserting while we did so, that new gums, resins, substitutes for gutta percha and india rubber, might be discovered. This new gum is the first fruits of such explorations, and perhaps, by the Rider process of vulcanising gutta percha, it may be adapted for making water-proof fabrics. Not one tithe of the natural riches of our extensive country have been developed yet.

Drying Potatoes.

The *Country Gentleman* states that M. Bollman, professor of an agricultural institution in Russia,—by experiments extending through three years, from 1850, has demonstrated that the drying of seedling potatoes is a sure preventive of the rot. They should be dried in a room at a temperature of about 100°.

History of Reaping Machines.—No. 9.

FIG. 28.



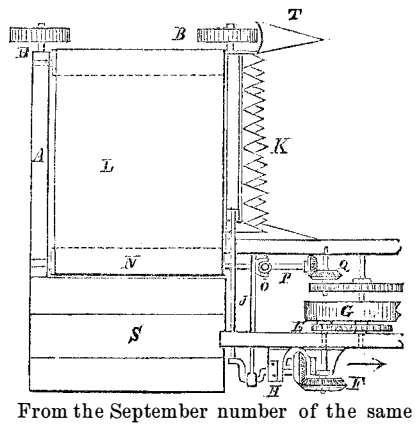
In July 1852 the *Practical Mechanic's Journal*, of London, gave an account of a reaping machine registered for Mr. Mason, of Ipswich, which we illustrate by the annexed figure, 28, representing a plan view.

This machine differs from its celebrated American cotemporary in having rotary cutters.

The frame, A, to which the shafts for drawing the machine are attached, carries a floor or platform, B, with hinged flaps at the sides, and carrying on its front edge a series of combs or teeth, C. The opposite end of the frame carries bearings for a cross shaft, at the center of which is a traveling wheel, D, having attached to it a spur wheel for actuating the pinion, E. The shaft of the latter carries a second wheel, in gear with a second pinion on the shaft, F, beneath the floor.

The latter shaft has upon it three pulleys, communicating motion by means of endless chains or bands to the three horizontal pulleys fast on the shafts of the horizontal rotary cutters, G. The cutters are capable of being disengaged at pleasure by the lever, H, and sliding clutch. The shafts or guiding handles, by which the machine is directed, are broken away at I I, the machine being traversed by the drag links, J J.

FIG. 29.



From the September number of the same journal, we extract the following account of a reaper registered for Messrs. W. Wray & Son, of Leeming, and illustrated by figure 29.

Our engraving is a plan view of the machine. It is built up from a timber framework, A, carried on the running wheels, B C. The cutters are actuated from the large front carrying wheel, C, the shaft of which carries a spur wheel, D, driving a pinion, E, fast on the short shaft projecting from the frame, and having on its end the bevel wheel, F. Hence the motion is conveyed by a bevel pinion, G, so as to drive the double crank shaft, H; each crank having a connecting rod, J, passing across the frame to the two long transverse cutter blades or knives, K. These knives slide horizontally on fixed guides, and being serrated in the usual manner, they are so set one above the other, that when at work and moving in contrary directions, each serration acts as a pair of shears. Thus as the machine travels forward against the standing grain, the cutting edges form their own abutment for the stalks during the severing action; and the stalks cut exactly as they stand, fall upon the endless traveling web, or carrier, L. This carrier cloth is extended over a pair of rollers, M N, and is made to travel continually at right angles to the path of the machine by the roller, N, the spindle of which is connected by a universal joint at O, with the shaft, P. The opposite end of this shaft is connected by a pair of bevel pinions, Q, and a pair of spur wheels, R, with the shaft of the running wheel, C. The carrier cloth travels in the direction of the arrow, and keeps up a stream of cut grain upon the delivery board, S, whence the grain is raked off by hand whenever the accumulation amounts to the necessary quantity for a sheaf. At the front outside corner of the framing a dividing iron, T, is fixed for denoting the line of cut. The horses are harnessed to a pole attached to the narrow frame in which the front runner, C, is set.

Grape Culture and Wine Manufacture in Ohio.

The Cincinnati *Gazette* contains a long and interesting article on the grape culture and wine manufacture in that vicinity. It appears that in 1846 there were 83 vineyards in the neighborhood of Cincinnati, containing 248 acres under cultivation, and 114 bearing, and although the crop the preceding year was but a partial one, twenty-four thousand gallons was the yield. In 1852, twelve hundred acres were in cultivation, seven hundred and fifty bearing; the annual yield was supposed to be five hundred thousand gallons, and the value of sparkling wine alone, $175,000. A bushel of grapes will make from three to three-and-a-half gallons of juice. Mr. Buchanan commenced planting his vineyard in 1843; in 1850, from three acres he realized, besides the cuttings, 1,640 gallons of wine.—In 1853 he obtained from five acres 4,326 gallons, or 847 gallons per acre. In particular spots there have been obtained 800 gallons from an acre, but 650 gallons is considered a large yield. The demand for Catawba wine is far ahead of the supply, and the quality is constantly being improved, both by the cultivators and those who prepare it for market.

Elliott the Aeronaut Outwitted.

The Richmond (Va.) *Dispatch* of the 3rd inst., states that Mr. Elliott having made arrangements for a balloon ascension from that place, was prevailed upon by a young man named Carrier to allow him to make a brief ascent by cords. Carrier having got into the car, soon rose above the heads of the multitude, when, to the astonishment of every spectator, he cut the cords which held the balloon to the earth, and sailed rapidly off towards the sky The disappointment of Mr. Elliott, who was anticipating a magnificent aerial voyage, so affected him that he fainted. Carrier succeeded in making a safe descent, very much to the surprise of everybody, but his conduct was condemned by every right-thinking person.

Pillar Letter Boxes.

A simple and efficient plan for facilitating the posting of letters in the most populous parts of London has been adopted. It consists of placing pillar letter boxes along the leading thoroughfares, at intervals of half a mile or thereabouts. These hollow pillars will be fitted for the reception of letters, and fixed on the footway, in such a position as not to obstruct traffic of any kind, and the Post-office Department will itself bear the whole cost of construction and erection. The letters are to be taken out every hour, so as to continue the present admirable system of the London Post-office, whereby any letter posted within three miles of the General Post-office, is delivered to its address within a period of not more than two hours from the time at which it was deposited in the letter box.

The Largest Mill in the World.

The Lowell (Mass.) *Journal* says:—The largest and most comprehensive mill in the world is the *Pacific*, at Lawrence. It makes none but the finest kinds of goods, and the success of its operations is looked to with great interest by manufacturers. The floor surface of this immense structure is sixteen acres—the largest mill in England is eleven and a half acres. There is now in operation 40,000 cotton spindles, and 10,000 worsted spindles; and these are to be increased to 80,000 and 20,000 respectively. There are 1,200 looms in operation, to be increased to 2,400. These, with two thousand hands, produce 300,000 pieces of cloth per annum, one-half de laines. The weekly consumption of cotton is 20,000 pounds, say 1,500,000 per annum, and 500,000 pounds of wool. Once a month the two thousand hands assemble at the cashier's office, where Mr. Clapp pays out to them $50,000 for wages, appropriating to each one the exact amount she has earned.

LITERARY NOTICES.

THINGS AS THEY ARE IN AMERICA—By William Chambers, Editor of Chambers' Edinburgh *Journal*.—During the latter part of the year 1853, Mr. Chambers paid a visit to this country, and the observations here presented were published in his journal. The writer is evidently a close and careful observer of men and things, and his sketches are very free from that narrowmindedness which has characterized most of the English tourists who have visited and written about us. In Mr. Chambers' opinion we are neither heathenish nor extraordinarily refined, but we are a stirring, active, and enterprising people, in some respects ahead of our transatlantic brethren. Every American, and especially every foreigner should read Mr. Chambers' "Things as they are." Price 25 cents. P. D. Orvis, publisher, 130 Fulton st., New York.

A NEW HARMONY AND EXPOSITION OF THE GOSPELS—Consisting of a parallel and combined arrangement, on a new plan, of the narratives of the four Evangelists according to a continuous commentary, with brief notes subjoined. Being the first period of the Gospel history, with a supplement containing extended chronological and topographical dissertations, and a complete analytical index, by James Strong, A. M. Carlton & Philips, 200 Mulberry street, publishers, New York. The above is the comprehensive title to one of the most complete harmonies of the Gospels ever published. The work contains nineteen beautiful illustrations of the Holy Land, rendered divinely sacred to the Christian as the chosen spots where our Savior performed some of his mighty works. These, added to the clear and perspicuous commentary of the gifted author, render it a work of uncommon interest to all who love the teachings of the Gospels. Most of the illustrations are full page colored lithographs, and are well done. The typography is bold, clear, and inviting to the eye. It is sold at the very low price of $3.

THE MUSICAL BOQUET—Containing grand selections for the piano forte from the opera of La Favorita, by Donizetti. Price 12½ cents, just published by P. D. Orvis, 130 Fulton street. It is the intention of the publisher to continue the *Boquet* regularly.

The second number of "The Musical Boquet" contains the celebrated laughing song "a la buffo," "Pop goes the Weasel," and the favorite Scotch ballad "Hey Jonny Cope." Price 12½ cents. P. D. Orvis, Publisher, 130 Fulton st., New York.

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